Model Curriculum

QP Name: Oil Extraction and Refining Technician

QP Code: FIC/Q1008

QP Version: 1.0

NSQF Level: 4

Model Curriculum Version: 1.0

Food Industry Capacity and Skill Initiative (FICSI)
Shriram Bharatiya Kala Kendra (3rd Floor)
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Table of Contents

Training Parameters

Sector	Food Processing
Sub-Sector	Food Grain Milling
Occupation	Processing - Food Grain Milling (including oilseeds)
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/8160.1200
Minimum Educational Qualification and Experience	1. Class 12th 2. Class 10th and 2 years of relevant experience 3. Class 8th and 3 years of relevant experience
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 years
Last Reviewed On	24/02/2022
Next Review Date	23/02/2025
NSQC Approval Date	24/02/2022
QP Version	1.0
Model Curriculum Creation Date	20/01/2022
Model Curriculum Valid Up to Date	24/02/2025
Model Curriculum Version	1.0
Minimum Duration of the Course	360 + 30 OJT Hours
Maximum Duration of the Course	360 + 30 OJT Hours

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the participants will be able to:

- Perform activities for pre-processing of raw material.
- Perform various tasks to extract oil by pressing method and solvent extraction method.
- Perform various tasks to refine oil as per organisational standards.
- Perform various post-production activities such as cleaning, storing, maintenance etc.
- Apply necessary health and safety practices to ensure food safety and personal hygiene
- Work with various organisational departments effectively
- Use resources at the workplace optimally

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Bridge Module	**32:00 Hours**	**12:00 Hours**	**00:00 Hours**	**00:00 Hours**	**44:00 Hours**
Module 1: Introduction to food processing sector and the job of an Oil Extraction and Refining Technician	04:00 Hours	00:00 Hours	00:00 Hours	00:00 Hours	04:00 Hours
Module 2: Employability and Entrepreneurship Skills	28:00 Hours	12:00 Hours	00:00 Hours	00:00 Hours	40:00 Hours
FIC/N9026: Prepare for production NOS Version No.: 1.0 NSQF Level: 3	**12:00 Hours**	**32:00 Hours**	**00:00 Hours**	**00:00 Hours**	**44:00 Hours**
Module 3: Prepare for production	12:00 Hours	32:00 Hours	00:00 Hours	00:00 Hours	44:00 Hours
FIC/N1029: Carry out oil extraction NOS Version No.: 1.0 NSQF Level: 4	**27:00 Hours**	**65:00 Hours**	**30:00 Hours**	**00:00 Hours**	**122:00 Hours**
Module 4: Carry out oil extraction by pressing method	15:00 Hours	41:00 Hours	15:00 Hours	00:00 Hours	71:00 Hours
Module 5: Carry out oil extraction by solvent extraction method	12:00 Hours	24:00 Hours	15:00 Hours	00:00 Hours	51:00 Hours

FIC/N1030: Carry out oil refining NOS Version No.: 1.0 NSQF Level: 4	**32:00 Hours**	**72:00 Hours**	**00:00 Hours**	**00:00 Hours**	**104:00 Hours**
Module 6: Perform degumming and bleaching of extracted oil	12:00 Hours	24:00 Hours	00:00 Hours	00:00 Hours	36:00 Hours
Module 7: Perform dewaxing of extracted oil	08:00 Hours	20:00 Hours	00:00 Hours	00:00 Hours	28:00 Hours
Module 8: Perform de-odorizing and post production activities	12:00 Hours	28:00 Hours	00:00 Hours	00:00 Hours	40:00 Hours
FIC/N9901: Implement health and safety practices at the workplace NOS Version No.: 1.0 NSQF Level: 3	**08:00 Hours**	**16:00 Hours**	**00:00 Hours**	**00:00 Hours**	**24:00 Hours**
Module 9: Ensuring food safety and personal hygiene	04:00 Hours	08:00 Hours	00:00 Hours	00:00 Hours	12:00 Hours
Module 10: Managing accidents and emergencies	04:00 Hours	08:00 Hours	00:00 Hours	00:00 Hours	12:00 Hours
FIC/N9902: Work effectively in an organization NOS Version No.: 1.0 NSQF Level: 3	**08:00 Hours**	**08:00 Hours**	**00:00 Hours**	**00:00 Hours**	**16:00 Hours**
Module 11: Working effectively in an organization	08:00 Hours	08:00 Hours	00:00 Hours	00:00 Hours	16:00 Hours
SGJ/N1702: Optimize resource utilization at workplace NOS Version No.: 1.0 NSQF Level: 3	**12:00 Hours**	**24:00 Hours**	**00:00 Hours**	**00:00 Hours**	**36:00 Hours**
Module 12: Material conservation	04:00 Hours	08:00 Hours	00:00 Hours	00:00 Hours	12:00 Hours
Module 13: Energy/ electricity conservation	04:00 Hours	08:00 Hours	00:00 Hours	00:00 Hours	12:00 Hours
Module 14: Waste management/recycling	04:00 Hours	08:00 Hours	00:00 Hours	00:00 Hours	12:00 Hours
Total Duration	**131 Hours**	**229 Hours**	**30:00 Hours**	**00:00 Hours**	**390 Hours**

Module Details

Module 1: Introduction to food processing sector and the job of an 'Oil Extraction and Refining Technician'

Bridge Module

Terminal Outcomes:

- State the importance of an Oil Extraction and Refining Technicians in a food processing industry
- Discuss the roles and responsibilities of an Oil Extraction and Refining Technician in a food processing industry

Duration: *04:00*	**Duration**: *00:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the roles and responsibilities of an Oil Extraction and Refining Technician in a food processing industry. • Discuss the future trends and career growth opportunities available to an Oil Extraction and Refining Technician. • Discuss the significance of an Oil Extraction and Refining Technicians to ensure smooth operations in the food processing industry. • List various oil extraction and refining activities that are performed in the job. • List the various terminologies used in carrying out oil extraction and refining activities in food processing industry. • Discuss the organisational policies to be followed pertaining to the delivery standards, health, safety and hazard handling procedures, integrity, dress code, etc.	
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook.	
Tools, Equipment and Other Requirements	
Nil	

Module 2: Employability and Entrepreneurship skills

Bridge Module

Terminal Outcomes:

- Describe the traits of individual at workplace
- Demonstrate apply employability and entrepreneurship skills at workplace

Duration: *28:00*	**Duration:** *12:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss own strengths and weaknesses and analyse the gaps to ensure continuous improvement. • Discuss the measures to be undertaken to utilise time effectively thereby achieving maximum productivity. • List the characteristics of innovative individuals • List the levels of Maslow Hierarchy of needs • List the traits of effective team • Discuss tips for stress management • Discuss the importance of good work ethics • Discuss how to manage an enterprise • Describe how to plan effective strategies for solving problems and improving work culture within the team. • List the various types of digital marketing techniques. • Discuss the types and importance of e-commerce in promoting businesses. • List the various types of online banking services being used widely. • Discuss the procedure to apply for bank finances • List the elements of a proposal to attract future business opportunities and prospective clients. • Explain how to conduct entrepreneurial programs to identify business opportunities, generate employment and increase clientele. • Understand the make in India campaign • Discuss the importance of Swachh Bharat Abhiyan • Understand the importance of entrepreneurship • Describe the traits of successful entrepreneur • List the types of enterprises • Understand the importance of effective speaking and listening	• Show how to analyse a situation to identify gaps for improving the work process. • Demonstrate the procedure to plan the time taken to perform various tasks effectively. • Describe how market research is carried out • Role play the characteristics of an effective entrepreneur and leader • Demonstrate on how to identify new business opportunities • Prepare a sample plan to solve problems and improve productivity at the workplace. • Demonstrate the procedure to operate a computer for digital marketing, e-commerce, branding, etc. • Show how to use services such as NEFT, IMPS, UPI, RTGS for online banking.

• Discuss the importance of problem solving • Discuss how to deal with failures • Describe the core keys of marketing • Discuss ways to manage risks at workplace	

Classroom Aids:
White board/Chart papers, marker.
Tools, Equipment and Other Requirements
NIL

Module 3: Prepare for production

Mapped to FIC/N9026, v1.0

Terminal Outcomes:

- Discuss the standard practices to be followed for production
- Demonstrate the tasks to be performed at the workplace for planning the production

Duration: *12:00*	**Duration**: *32:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Elucidate production planning process. • Discuss analysis and interpretation of various process charts, product flow charts, etc. • Explain the resource management process. • Calculate procedure to estimate manpower and raw material. • List down equipment type and its use. • Explain the capacity utilization calculation. • Discuss the organizational policies and SOP on cleanliness. • List down the basic concept of food safety and hygiene. • Describe the operating procedure and general maintenance of food production machineries. • State waste management procedures. • List down the methods to inspect tools, equipment and machinery. • Discuss the procedure to allot work or responsibility to the team.	• Apply work requirements by obtaining instructions from the supervisor. • Instructions: process chart, product flow chart, formulation, chart, etc. • Prepare, plan and prioritize tasks as per work schedule. • Tasks: inspect, clean, maintain, verify the area and tools, etc. • Calculate the manpower and material requirements as per work requirement, • Material: raw materials and packaging materials. • Show the required quantity of raw materials, packaging materials, equipment, and manpower for production. • Demonstrate capacity utilization of machinery with respect to the processing time, production order, and batch size for each product. • Perform cleaning and maintain the work area as per organizational procedures. • Perform cleaning and maintain the machines and tools and sanitize them as per the organization's specifications and standards. • Show disposal of the waste material at designated place safely. • Display the tools, equipment, and machinery to ascertain suitability for use. • Conduct role play to report information such as faulty tools and equipment to the concerned authority.
Classroom Aids	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	

Safety gloves, Face mask, Safety shoes, Safety hat, Apron, Measuring Cylinder, Hand Scoop - (Ells Cup), Pelican Sampler, Weighing balance , Tinto meter, Plastic beaker, GAS Chromatography, HPLC, UV Spectrometer, Moisture analyser, PH meter, Conductivity meter, Karl fisher, Constant water bath, Dry bath, Heating mental, Analytical balance, Hot air oven, Muffle furnace, Cod digester, Deep freezer, Turbidity meter, Water bath, KF moisture analyzer, RI refractometer, Refractometer DR2800, Vacuum oven, Centrifuge, Wrist shaker, Magnet stirrer, Hot plate, Autoclave, Horizontal laminar air flow, Biosafety cabinet clean bench, Micro pipette, Thermometer, Projection microscope, Bod incubator, Incubator, Colony counter

Module 4: Carry out oil extraction by pressing method

Mapped to FIC/N1029, v1.0

Terminal Outcomes:

- Perform various tasks for pre-processing of raw materials
- Perform various tasks for extracting oil by pressing method
- Describe the process to extract oil by pressing method

Duration: *15:00*	**Duration**: *41:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the safety norms followed in food processing industry production line as per FSSAI-Schedule IV. • Describe FSSAI laws and regulations on product, R.M, P.M etc. • Describe PRP's OPRP's and CCP, HACCP as per Process flow chart of organization. • List different types of raw materials such as peanut, sunflower seed, sesame seeds, soya bean, corn, etc. used in oil extraction process. • Discuss various physical parameters such as appearance, colour, odour, texture etc. of raw material. • List various machineries and equipment used in oil extraction such as drier, cleaning machine, de-stoner, cracking mill, cooking /conditioning equipment, screw press machine, solvent sprayers, distillation system, etc. required for oil extraction activities. • List the steps to be performed for setting up the machines for oil extraction and refining process. • List the steps to be performed for setting up the dryer and performing the drying process of raw material. • List the steps to be performed for setting the controls of the fan and performing the cooling process of dried raw material. • List the steps to be performed for destoner process of raw material. • List the steps to be performed for setting the controls of cracking mill and performing the cracking process of raw material. • List the steps to be performed for de-hulling process on the cracked raw materials. • List the steps to be performed for flaking process.	• Role play a situation to check that working area is safe or not and informing the concerned person if area is safe to start work. • Show how to interpret the process chart/product flow chart/formulation chart for production of edible vegetable oil. • Apply appropriate ways to check the weight and quality of the received raw materials from the supplier/warehouse. • Show how to set up the machines for oil extraction and refining process. • Demonstrate operating procedure of all machineries and equipment used in oil extraction such as drier, cleaning machine, de-stoner, cracking mill, cooking /conditioning equipment, screw press machine, solvent sprayers, distillation system, etc. • Show how to set the controls of the dryer for drying process of the weighed raw materials. • Demonstrate drying process of the weighed raw materials. • Show how to set the controls of the fan for cooling process of the dried raw materials. • Demonstrate cooling process of the dried raw materials. • Show how to remove metals or open chute by dumping the raw materials in the feed hopper and passing it through a magnet detector. • Demonstrate procedure of transferring raw material from storage silo to cleaning machines and removing impurities like straw, sticks, etc. from it. • Demonstrate de-stoner process for collection of destoned material. • Demonstrate the procedure of discarding the waste materials safely.

• Discuss various parameters i.e., temperature, pressure, time, etc. need to maintain for cooking of raw material. • Discuss the importance of monitoring process parameters during the cooking and correcting them as per the requirements. • List the steps to be performed for extracting the oil by using pressing machine. • Discuss pressing machine parameters such as speed, temperature, pressure, etc. and their impact on output. • Discuss various methods for checking the quality of extracted oil. • Describe sample collection procedures of R.M and P.M, SFG, FG.	• Show how to set controls of the cracking mill. • Demonstrate cracking process of the raw materials. • Demonstrate de-hulling process on the cracked raw materials for separating kernels and removing hull. • Show how to adjust clearance between rollers of the flaking machine and dump/open chute for flaking and collect the flakes from the discharged chute. • Show how to set the parameters of the cooking vessel to cook the raw materials. • Read the gauges to monitor the process parameters and maintain them by adjusting the controls as per the SOP. • Apply appropriate ways to check temperature and moisture content of the raw materials. • Employ practices to inject the water/steam into the cooked/conditioned raw materials for adjusting the moisture content as per the standard requirement. • Show how to set the pressing machine and its parameters for extracting oil as per the work instructions. • Demonstrate pressing process for extracting the oil from cooked material. • Apply appropriate ways to assess the temperature sample of expelled oil cake/meal and determine that enough oil has been removed. • Apply appropriate methods to check the quality of extracted oil as per SOP. • Show how to transfer the sample of extracted oil to the quality lab for analysis. • Employ practices to collect, pack and store the extracted oil or by-product i.e., oil cake or oil meal as per SOP.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Safety gloves, Face mask, Safety shoes, Safety hat, Apron, Measuring Cylinder, Hand Scoop - (Ells Cup), Pelican Sampler, Weighing balance , Tinto meter, Plastic beaker, GAS Chromatography, HPLC, UV Spectrometer, Moisture analyser, PH meter, Conductivity meter, Karl fisher, Constant water bath, Dry bath, Heating mental, Analytical balance, Hot air oven, Muffle furnace, Cod digester, Deep freezer, Turbidity meter, Water bath, KF moisture analyzer, RI refractometer, Refractometer DR2800, Vacuum oven, Centrifuge, Wrist shaker, Magnet stirrer, Hot plate, Autoclave, Horizontal laminar air flow, Biosafety cabinet clean bench, Micro pipette, Thermometer, Projection microscope, Bod incubator, Incubator, Colony counter	

Module 5: Carry out oil extraction by solvent extraction method

Mapped to FIC/N1029, v1.0

Terminal Outcomes:

- Perform various tasks for extracting oil by solvent extraction method
- Discuss the steps involved in extraction of oil by solvent extraction method

Duration: *12:00*	**Duration**: *24:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the steps to be performed for extracting oil by solvent extraction method. • List the steps to be performed for removing solvent and separating oil into distillation system. • Discuss the importance of maintaining process parameters i.e. temperature, pressure, etc. of distillation system. • List the steps to be performed for removing solvent and moisture into desolventizer. • Discuss the importance of maintaining process parameters i.e. temperature, steam pressure, speed of rotation valve speed of rotation stirrer, etc. of desolventizer. • Discuss various methods for packing and storing the extracted oil.	• Apply appropriate ways to weigh flaked raw materials (oilseeds or oil cake/meal) and transfer into the feeding hopper. • Show how to maintain quantity of raw materials in the extractor by adjusting adjust the speed of conveyor and adjust the height of raw materials bed in the extractor by adjusting dampers of the extractor conveyor. • Apply appropriate ways to spray solvent and oil-solvent mixture (miscella) on the bed of raw materials flakes and on the materials conveyor screen and collect the oil rich solvent (full miscella) in collection tank. • Demonstrate procedure of removing solvent and separating oil into distillation system. • Show how to collect crude oil in container/storage tank and transfer its sample to the quality lab for analysis. • Demonstrate procedure of removing solvent and moisture into desolventizer and drying the spent meal. • Apply appropriate ways to pack and store the extracted oil as per SOP.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Safety gloves, Face mask, Safety shoes, Safety hat, Apron, Measuring Cylinder, Hand Scoop - (Ells Cup), Pelican Sampler, Weighing balance , Tinto meter, Plastic beaker, GAS Chromatography, HPLC, UV Spectrometer, Moisture analyser, PH meter, Conductivity meter, Karl fisher, Constant water bath, Dry bath, Heating mental, Analytical balance, Hot air oven, Muffle furnace, Cod digester, Deep freezer, Turbidity meter, Water bath, KF moisture analyzer, RI refractometer, Refractometer DR2800, Vacuum oven, Centrifuge, Wrist shaker, Magnet stirrer, Hot plate, Autoclave, Horizontal laminar air flow, Biosafety cabinet clean bench, Micro pipette, Thermometer, Projection microscope, Bod incubator, Incubator, Colony counter	

Module 6: Perform degumming and bleaching of extracted oil

Mapped to FIC/N1030, v1.0

Terminal Outcomes:

- Perform preparatory activities for carrying out the oil refining process.
- Discuss various tasks related to degumming and bleaching of extracted oil.

Duration: *12:00*	**Duration**: *24:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Summarise the preparatory activities need to perform for refining of oil. • List machineries such as heat exchanger, centrifuge, bleaching heat exchanger, bleacher, thermal oil heater, economizer/ economizer, de-odourizer/pre-stripper, packaging, labelling, and date coding, etc. required for oil refining activities. • List the steps to be performed for setting the controls of heat exchanger and performing the heating of oil. • List the steps to be performed for degumming or neutralizing of oil in centrifugal mixer. • Summarise the steps to be performed for water washing and drying process. • State the importance of removing moisture from the neutralized oil under the vacuum. • List the steps to be performed for bleaching the oil. • Discuss various process parameters i.e. pressure, temperature, retention time, etc. of bleacher and their impact on output. • List the steps to be performed for filtering the oil from earth. • Discuss various methods for checking the quality of spent earth residual oil.	• Perform preparatory activities such as collection of crude oil from storage, preparation of chemicals etc. as per SOP • Demonstrate operating procedure of all machineries such as heat exchanger, centrifuge, bleaching heat exchanger, bleacher, thermal oil heater, economizer/ economizer, de-odourizer/pre-stripper, packaging, labelling, and date coding, etc. • Demonstrate how to set the controls of heat exchanger and heat the oil at specified temperature in it as per SOP. • Show how to add heated oil, measured quantity of phosphoric acid or citric acid and sodium hydroxide solution (caustic lye solution) into centrifugal mixer. • Demonstrate how to set the controls of centrifugal mixer and separate the non-hydratable gums and soap stock from oil in it as per SOP. • Demonstrate how to set the controls of heat exchanger and heat the separated oil in it. • Demonstrate water washing process for removing the residual gums from oil as per SOP. • Apply appropriate ways to separate the neutralized oil from washed water and transfer it to the collection tank. • Demonstrate how to set the controls of dryer and remove the moisture from the neutralized oil in it as per SOP. • Demonstrate how to set the controls of heat exchanger and heat the degummed and dried oil in it as per SOP. • Demonstrate how to set the controls of bleacher and perform bleaching process as per SOP. • Apply appropriate ways to remove any residual gums and soaps, colours, impurities, trace metals, etc. from bleached oil.

	• Demonstrate the procedure of filtering the dried oil and removing the spent earth by using series of two pressure leaf filters. • Apply appropriate ways to polish the filtered oil, remove the residual oil and collect it in the recovered oil tank. • Apply appropriate methods to check the quality of spent earth residual oil as per SOP. • Employ appropriate ways to heat the oil and liquify it.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Safety gloves, Face mask, Safety shoes, Safety hat, Apron, Measuring Cylinder, Hand Scoop - (Ells Cup), Pelican Sampler, Weighing balance , Tinto meter, Plastic beaker, GAS Chromatography, HPLC, UV Spectrometer, Moisture analyser, PH meter, Conductivity meter, Karl fisher, Constant water bath, Dry bath, Heating mental, Analytical balance, Hot air oven, muffle furnace, Cod digester, Deep freezer, Turbidity meter, Water bath, KF moisture analyzer, RI refractometer, Refractometer DR2800, Vacuum oven, Centrifuge, Wrist shaker, Magnet stirrer, Hot plate, Autoclave, Horizontal laminar air flow, Biosafety cabinet clean bench, Micro pipette, Thermometer, Projection microscope, Bod incubator, Incubator, Colony counter	

Module 7: Perform dewaxing of extracted oil

Mapped to FIC/N1030, v1.0

Terminal Outcomes:

- Perform various tasks related to dewaxing of the oil.
- Discuss the methods to perform dewaxing of extracted oil

Duration: *08:00*	**Duration**: *20:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe methods to liquify the oil. • Discuss methods to cool down the heated oil at specified temperature. • List the steps to be performed for agitation of cooled oil. • Discuss various methods for checking the quality of dewaxed oil.	• Employ appropriate ways to heat the oil and liquify it. • Apply appropriate methods to cool down the oil to required temperature as per SOP. • Demonstrate how to set the controls of agitator and agitate cooled oil in it as per SOP. • Show how to remove precipitated solids from filtered oil and transfer the dewaxed oil sample to the quality lab for analysis.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Safety gloves, Face mask, Safety shoes, Safety hat, Apron, Measuring Cylinder, Hand Scoop - (Ells Cup), Pelican Sampler, Weighing balance , Tinto meter, Plastic beaker, GAS Chromatography, HPLC, UV Spectrometer, Moisture analyser, PH meter, Conductivity meter, Karl fisher, Constant water bath, Dry bath, Heating mental, Analytical balance, Hot air oven, Muffle balance, Cod digester, Deep freezer, Turbidity meter, Water bath, KF moisture analyzer, RI refractometer, Refractometer DR2800, Vacuum oven, Centrifuge, Wrist shaker, Magnet stirrer, Hot plate, Autoclave, Horizontal laminar air flow, Biosafety cabinet clean bench, Micro pipette, Thermometer, Projection microscope, Bod incubator, Incubator, Colony counter	

Module 8: Perform de-odorizing and post production activities

Mapped to FIC/N1030, v1.0

Terminal Outcomes:

- Perform various tasks related to de-odorizing the oil.
- Perform post-production tasks such as packaging, storing, cleaning and maintenance.
- Describe the methods to perform de-odorizing the oil.

Duration: *12:00*	**Duration**: *28:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the steps to be performed for de-odourizing of oil. • Discuss various methods for checking the quality of de-odourized oil. • Describe various post production activities such as packaging, storing, cleaning and maintenance of equipment. • Discuss the information need to mention on packaging labels. • Summarise the steps to be performed for packaging, labelling and storing of refined oil. • List the documents and records to be prepared and maintained pertaining to the oil extraction and refining tasks being carried out. • Discuss various methods for cleaning of the work area, machineries, equipment and tools.	• Demonstrate organisational procedure to pre-heat the oil in economizer and creating the vacuum in the deaerator tank by using it. • Demonstrate how to set the controls of de-odorizing economizer and remove the free fatty acid and other volatile impurities from the oil as per SOP. • Apply appropriate methods to cool down the de-odourized oil to required temperature and collect it in storage tank as per SOP. • Apply appropriate methods to check the quality of de-odourized oil by checking its physical parameters i.e. colour, odour, viscosity, etc. as per SOP. • Demonstrate organisational procedure of packaging and labelling the refined oil in packaging machine and then storing the packed material into storage area. • Prepare sample documents and records consisting of information related to production tasks performed, process details and the types of finished products produced. • Perform steps to report the supervisor about discrepancies/concerns during production process and for taking immediate action to resolve the same. • Show how to verify documents and track the finished product details, in case of quality concerns and for quality management system audits. • Apply appropriate ways to and implement suggested corrective actions by following organisational procedures. • Apply appropriate ways to clean the work area, machineries, equipment and tools as per industry standards and procedures.

	• Demonstrate periodic maintenance of all machines and equipment by following the SOP and manufacturer's instructions.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Safety gloves, Face mask, Safety shoes, Safety hat, Apron, Measuring Cylinder, Hand Scoop - (Ells Cup), Pelican Sampler, Weighing balance , Tinto meter, Plastic beaker, GAS Chromatography, HPLC, UV Spectrometer, Moisture analyser, PH meter, Conductivity meter, Karl fisher, Constant water bath, Dry bath, Heating mental, Analytical balance, Hot air oven, Muffle furnace, Cod digester, Deep freezer, Turbidity meter, Water bath, KF moisture analyzer, RI refractometer, Refractometer DR2800, Vacuum oven, Centrifuge, Wrist shaker, Magnet stirrer, Hot plate, Autoclave, Horizontal laminar air flow, Biosafety cabinet clean bench, Micro pipette, Thermometer, Projection microscope, Bod incubator, Incubator, Colony counter	

Module 9: Ensuring food safety and personal hygiene

Mapped to FIC/N9901, v1.0

Terminal Outcomes:

- Explain the ways to ensure food safety and personal hygiene at the workplace
- Demonstrate the steps to be followed for implementing good hygiene and manufacturing practices

Duration: *04:00*	**Duration**: *08:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Define hazards and risks. • Recall the various types of health and safety equipment available in an organisation and the methods for obtaining them. • Discuss the organisational health and safety policies and procedures. • Discuss the relevant health and safety standards to be followed in the job as listed in 'The Food Safety and Standards Act, 2006'. • Explain the importance of wearing appropriate personal protective equipment (such as eye protection, hard hats, gloves apron, rubber boots, etc.) and ensuring personal hygiene at the workplace. • Elucidate the ways to prevent product contamination and cross contamination at the workplace. • Discuss the ways to handle items that can lead to allergic reactions in a retail environment. • State the importance of preventive health check-ups for ensuring personal hygiene. • State the importance of storing food at specified temperature. • Discuss the importance of sanitising self and the work area safely and appropriately. • Recall the ways to store the sanitising materials appropriately.	• Employ appropriate techniques to prevent product contamination and cross contamination. • Demonstrate the steps to be performed for implementing good manufacturing practices (GMP) in a retail environment. • Show how to treat injuries such as cuts, boils, skin infections and grazes appropriately. • Apply suitable methods for disinfecting the work area and equipment thoroughly. • Demonstrate how to wash hands and use alcohol-based sanitisers appropriately. • Show how to wear personal protective equipment such as gloves, hairnets, masks, ear plugs, goggles, shoes etc. properly ensuring adequate protection. • Prepare a sample report consisting of information such as illness to self and others as per organisational practice. • Roleplay a situation on how to communicate with the supervisor for reporting illness of self and others.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Gloves, hair net, shoe cover, soap dispenser, hand sanitizer, ear plugs, masks, aprons/lab coats eye protection, hard hats, gloves, rubber boots, etc.	

Module 10: Managing accidents and emergencies

Mapped to FIC/N9901, v1.0

Terminal Outcomes:

- List the various types of accidents and emergencies that can arise at the workplace and the ways to address them
- Demonstrate the steps to be followed to implement emergency and evacuation procedures effectively

Duration: *04:00*	**Duration**: *08:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the various types of health and safety hazards present in the environment. • Discuss the possible causes of risk, hazard or accident at the workplace. • Elucidate the standard practices and precautions used to control and prevent risks, hazards and accidents at the workplace. • Discuss the dangers associated with the use of electrical and other equipment. • State the importance of using protective equipment and clothing for specific tasks and work conditions. • Discuss the role of organisational protocols in preventing accidents and hazards. • Recall the preventive and remedial actions to be taken in the case of exposure to toxic materials at the workplace. • Discuss the various causes of fire and ways to prevent them. • Elaborate the steps to use different types of fire extinguishers. • Explain the procedure to provide artificial respiration and cardio-pulmonary resuscitation (CPR) to the affected. • Summarise the rescue techniques to be followed at times of fire hazard. • Discuss the significance of various types of hazard and safety signs. • Discuss the workplace emergency and evacuation procedures. • Elaborate the type of first-aid treatment to be offered at times of shock, electrical shock, bleeding, breaks to bones, minor burns, resuscitation, poisoning, eye injuries, etc. • Discuss about the potential injuries and ill health conditions that are caused due to incorrect manual handling practices.	• Apply appropriate techniques to deal with hazards safely and appropriately. • Demonstrate the use of various types of fire extinguishers effectively. • Demonstrate appropriate ways to respond to an accident situation or medical emergency promptly and appropriately. • Demonstrate the steps to be followed for providing artificial respiration and cardio-pulmonary resuscitation (CPR) in various instances (e.g. cardiac arrest). • Perform the steps to be followed during emergency and evacuation procedure. • Demonstrate the procedure of freeing a person from electrocution. • Show how to administer appropriate first aid to victims in case of cuts, bleeding, burns, choking, electric shock, poisoning etc.

• List the precautions to be taken while lifting and carrying materials in a food retail environment.	
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Helmet, gloves, rubber mat, ladder, neon tester, leather or asbestos gloves, flame proof aprons, flame proof overalls buttoned to neck, cuff less (without folds) trousers, reinforced footwear, helmets/hard hats, cap and shoulder covers, ear defenders/plugs, safety boots, knee pads, particle masks, glasses/goggles/visors, hand and face shields, machine guards, residual current Devices, shields, dust sheets, respirator.	

Module 11: Working effectively in an organization

Mapped to FIC/N9902, v1.0

Terminal Outcomes:

- State the importance of proper communication and teamwork at the workplace
- Roleplay a situation to communicate with others effectively

Duration: *08:00*	**Duration**: *08:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the applicable organisational quality procedures and processes for working effectively in a team. • Elucidate the legislations, standards, policies, and procedures followed in the organization relevant to employment, behaviour, harassment, discrimination, and performance conditions. • State the importance of well-defined reporting structure in an organisation. • List the various types of inter-dependent functions applicable in the job. • Discuss the different types of harassment and discrimination based on gender, disability, caste, religion, and culture. • List the key factors that aid in prioritising tasks. • Discuss the components of effective communication and its importance at the workplace. • State the impact of poor communication on the employee, the employer, and the customer. • State the importance of teamwork in organizational and individual success. • Discuss the importance of ethics and discipline for professional success. • Explain the ways to address grievances appropriately and effectively. • Discuss the importance of managing interpersonal conflicts effectively and ways to do so. • List the different types of disabilities and the challenges faced by persons with disability (PwD). • Discuss the applicable laws, acts and provisions defined for PwD by the statutory bodies. • State the importance of gender sensitivity and equality.	• Roleplay a situation on how to obtain information, seek clarifications, reciprocate understanding and provide information accurately and clearly. • Roleplay a situation on how to use inclusive language (verbal, non-verbal and written) that is gender, disability and culturally sensitive while interacting with others. • Show how to consult and assist others to maximize effectiveness and efficiency at work. • Dramatise a situation to show how to escalate problems and grievances beyond own scope to the concerned authority. • Roleplay a situation on how to take appropriate action to resolve conflicts at the workplace. • Roleplay a situation on how to report incidents of harassment and discrimination to appropriate authority.

• Discuss the applicable legislations, grievance redressal mechanisms, and penalties against harassment at the workplace. • State the importance of transacting with others without personal bias.	
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Nil	

Module 12: Material Conservation

Mapped to SGJ/N1702, v1.0

Terminal Outcomes:

- Discuss optimal usage of material including water in various tasks/activities/processes

Duration: *04:00*	**Duration**: *08:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the types of hazards, risks and threats associated with handling different materials. • Discuss the role of workstation layout, electrical and thermal equipment used in the material conservation. • Discuss organisational procedures for minimising waste. • Elucidate practices of efficient and inefficient management and utilization of material and water at the workplace. • Discuss the ways to manage material and water usage at work effectively.	• Show how to check for spills and leakages in various materials applicable in the job. • Demonstrate how to plug the spills and leakages appropriately. • Roleplay a situation on how to escalate any issues related to repair of spills and leakages to the concerned authority effectively. • Demonstrate the standard practices to be followed for cleaning tools, machines and equipment effectively.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Materials and tools and equipment used at work	

Module 13: Energy/electricity conservation

Mapped to SGJ/N1702, v1.0

Terminal Outcomes:

- Discuss optimal usage of energy/electricity

Duration: *04:00*	**Duration**: *08:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Define electricity. • Discuss the basics of electricity. • List the energy efficient devices that are used in the job. • Discuss the ways to identify electrical problems that can arise during work. • Discuss the standard practices to be followed for conserving electricity in the job. • State the impact of improperly connected electrical equipment and appliances on the tasks being performed.	• Apply suitable techniques to check the equipment/machinery for desired level of functioning. • Employ appropriate methods to rectify faulty equipment/machinery safely. • Roleplay a situation on how to report equipment faults and maintenance lapses to the concerned personnel effectively.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Energy saving devices	

Module 14: Waste management/recycling

Mapped to SGJ/N1702, v1.0

Terminal Outcomes:

- Discuss the importance of minimal waste generation
- Demonstrate how to dispose waste as per industry approved standards

Duration: *04:00*	**Duration**: *08:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the various types of recyclable, non-recyclable, and hazardous waste. • State the significance of different coloured dustbins. • List the different types of waste to be segregated. • State the importance of waste management. • Discuss the standard methods for waste disposal. • List the sources of pollution. • Discuss the ways to minimise various types of pollution.	• Demonstrate the standard practices to be followed for segregating waste into respective categories. • Show how to dispose non-recyclable waste appropriately and safely. • Demonstrate the standard practice for depositing recyclable and reusable materials at designated place. • Show how to dispose hazardous waste safely and appropriately.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Non-recyclable, recyclable waste bins	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
B.Sc or graduate/B.Tech/BE	Food technology or food engineering	3	Food processing	1	Food processing	
M.Sc/M.Tech/ME	Food technology or food engineering	2	Food processing	1	Food processing	
Diploma /certificate course	(Food Technology / Food Engineering /packaging/Home science, Milling technology or allied sector	4	Food processing	1	Food processing	

Trainer Certification	
Domain Certification	**Platform Certification**
Certified for Job Role: "Oil Extraction and Refining Technician" mapped to QP: "FIC/Q1008, v1.0". Minimum accepted score is 80%.	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MEP/Q2601". Minimum accepted score as per MEPSC guidelines is 80%.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training/Assessment Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
M.Sc/M.Tech/ME	Food technology or food engineering	2	Food processing	1	Food processing	
B.Sc or graduate/B.Tech /BE	Food technology/ Home Science	3	Food processing	2	Food processing	
Diploma	Hotel management/ Food Science/ Home Science	4	Food processing	2	Food processing	

Assessor Certification	
Domain Certification	**Platform Certification**
Certified for Job Role: "Oil Extraction and Refining Technician" mapped to QP: "FIC/Q1008, v1.0". Minimum accepted score is 80%.	Recommended that the Assessor is certified for the Job Role: "Assessor", mapped to the Qualification Pack: "MEP/Q2701". Minimum accepted score as per MEPSC guidelines is 80%.

Assessment Strategy

This section includes the processes involved in identifying, gathering and interpreting information to evaluate the learner on the required competencies of the program.

Assessment will be based on the concept of Independent Assessors empanelled with Assessment Agencies, identified, selected, trained and certified on Assessment techniques. These assessors would be aligned to assess as per the laid down criteria.

Assessment Agency would conduct assessment only at the training centres of Training Partner or designated testing centers authorized by FICSI.

Ideally, the assessment will be a continuous process comprising of three distinct steps:

A. Mid- term assessment

B. Term / Final Assessment

Each National Occupational Standard (NOS) in the respective QPs will be assigned weightage. Therein each Performance Criteria in the NOS will be assigned marks for theory and / or practical based on relative importance and criticality of function.

This will facilitate preparation of question bank / paper sets for each of the QPs. Each of these papers sets / question bank so created by the Assessment Agency will be validated by the industry subject matter experts through FICSI, especially with regard to the practical test and the defined tolerances, finish, accuracy etc.

The following tools are proposed to be used for final assessment:

I. **Written Test:** This will comprise of
   a. True / False Statements
   b. Multiple Choice Questions
   c. Matching Type Questions

   Online system for this will be preferred.

II. **Practical Test**: This will comprise a test job to be prepared as per project briefing following appropriate working steps, using necessary tools, equipment and instruments. Through observation it will be possible to ascertain candidate's aptitude, attention to details, quality consciousness etc. The end product will be measured against the pre-decided MCQ filled by the Assessor to gauge the level of his skill achievements.

III. **Structured Interview**: This tool will be used to assess the conceptual understanding and the behavioural aspects as regards the job role and the specific task at hand.

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module. A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
FIFO	First In First Out
FEFO	First Expire First Out
GMP	Good Manufacturing Practices
GHP	Good Hygiene Practices
CPR	Cardiopulmonary Resuscitation
ETP	Effluent Treatment Plant