



Model Curriculum

QP Name: Oil Extraction and Refining Technician.

QP Code: FIC/Q1013

QP Version: 1.0

NSQF Level: 4

Model Curriculum Version: 1.0

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Training Parameters

Sector	Food Processing
Sub-Sector	Food Grain Milling
Occupation	Processing-Food Grain Milling (including oil seeds)
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/8160.1200
Minimum Educational Qualification and Experience	<p>12th grade pass with No Experience required</p> <p>Or</p> <p>10th Grade Pass with 3-year relevant experience in food quality assurance</p> <p>Or</p> <p>Previous relevant Qualification of NSQF Level 3.5 with 1.5 years of relevant experience in food quality assurance</p> <p>Or</p> <p>Previous relevant Qualification of NSQF Level 3.0 with 3-year relevant experience in food quality assurance</p>
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 years
Last Reviewed On	06/02/2026
Next Review Date	05/02/2029
NSQC Approval Date	06/02/2026
QP Version	1.0
Model Curriculum Creation Date	06/02/2026
Model Curriculum Valid Up to Date	05/02/2029
Model Curriculum Version	1.0
Minimum Duration of the Course	450 hours
Maximum Duration of the Course	450 hours

Program Overview

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

Training Outcomes

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

- Perform end-to-end operations of oil extraction and refining processes.
- Operate and maintain process equipment safely and efficiently, such as cleaning and de-stoning machines, screw press, extractor, distillation unit, centrifuge, bleacher, crystalliser, and packaging machinery.
- Ensure compliance with FSSAI, GMP, and workplace safety norms.
- Monitor, record, and document process parameters, batch data, and quality test results for crude and refined oil.
- Demonstrate professionalism and teamwork in industrial operations by coordinating effectively with production, maintenance, and quality departments.
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Compulsory Modules

The table lists the modules, their duration and mode of delivery.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
FIC/N9026: Prepare for Production NOS Version No. 1 NSQF Level: 4	20:00	20:00	20:00	-	60:00
Module 2: Prepare for Production	20:00	20:00	20:00	-	60:00
FIC/N1029: Carry out oil extraction NOS Version No. 3 NSQF Level: 4	30:00	60:00	90:00	-	180:00
Module 1: Introduction to food processing sector and the job of an Oil Extraction and Refining Technician	5:00	-	-	-	5:00
Module 3: Perform Pre-	5:00	10:00	10:00		25:00

processing of the raw materials					
Module 4: Carry Out Oil extraction by pressing method	5:00	20:00	30:00	-	60:00
Module 5: Carry Out Oil extraction by solvent extraction technique	10:00	20:00	30:00	-	60:00
Module 6: Perform cold press oil extraction	5:00	10:00	20:00	-	35:00
FIC/N1030: Carry Out Oil Refining NOS Version No. 2 NSQF Level: 4	60:00	50:00	40:00	-	150:00
Module 7: Refine oil using various methods	60:00	50:00	40:00	-	150:00
FIC/N9906: Apply Food Safety Guidelines in Food Processing NOS Version No. 1 NSQF Level: 4	10:00	20:00	-	-	30:00
Module 8: Practice personal hygiene and follow Good Manufacturing Practices at workplace	5:00	10:00	-	-	15:00
Module 9: Apply food safety practices at workplace	5:00	10:00			15:00
DGT/VSQ/N0101: Employability Skills (30 Hours) NOS Version No. 1 NSQF Level- 4	30:00	-	-	-	30:00
Module 10: Employability Skills	30:00	-	-	-	30:00
Total Duration	150:00	150:00	150:00	-	450:00

Module Details

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

Mapped to FIC/N1029, v3.0

Terminal Outcomes:

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

Duration: 5:00 (Hours)	Duration: 00:00 (Hours)
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the structure and significance of the food processing industry in India. • 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	
Participant handbook, Computer/Laptop with an internet connection, Whiteboard, Marker, Projector or large screen, Audio-visual equipment, PowerPoint presentation, Notebooks, Pens, etc.	
Tools, Equipment and Other Requirements	
NA	

Module 2: 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

<i>Duration: 20:00 (Hours)</i>	<i>Duration: 20:00 (Hours)</i>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Apply work requirements by obtaining instructions, such as process chart, product flow chart, formulation, chart, etc., from the supervisor. • Prepare, plan and prioritize tasks, such as inspect, clean, maintain, verify the area and tools, etc., as per work schedule. • Calculate the manpower and material (raw materials and packaging materials) requirements as per work requirement. • 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	

Participant handbook, Computer/Laptop with an internet connection, Whiteboard, Marker, Projector or large screen, Audio-visual equipment, PowerPoint presentation, Notebooks, Pens, etc.

Tools, Equipment and Other Requirements

Safety gloves, Face mask, Safety shoes, Safety hat, Apron, Measuring Cylinder, Hand Scoop - (Ellis 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 3: Perform Pre-processing of the raw materials

Mapped to FIC/N1029, v3.0

Terminal Outcomes:

- Apply appropriate pre-processing techniques to clean, de-stone, dry, cool, crack, de-hull, flake, and condition oilseeds as per SOP to achieve the required quality and moisture standards for oil extraction.
- Operate and maintain pre-processing equipment by setting process parameters and ensuring equipment safety and operational efficiency.
- Follow quality, safety, and environmental standards by adhering to FSSAI and organisational SOPs for raw material handling, workplace hygiene, and waste disposal to maintain a safe and compliant production environment.

Duration: 5:00 (Hours)	Duration: 10:00 (Hours)
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the importance of pre-processing in the overall oil extraction and refining process. • Identify the types of raw materials (oilseeds such as peanut, sunflower, sesame, soybean, corn, etc.) used in the oil extraction process. • Discuss the significance of workplace safety, hygiene, and personal protective equipment (PPE) during pre-processing operations, along with common hazards such as dust, mechanical injuries, and thermal exposure. • Interpret process flow charts and formulation charts to identify the sequence of operations and process parameters. • Discuss the working principles and functions of key pre-processing equipment, such as cleaning, de-stoning, drying, cracking, de-hulling, flaking, and conditioning units. • Explain the parameters influencing drying, cooling, and conditioning operations, including temperature, airflow, moisture content, pressure, and time. • Outline environmental and organisational SOPs for waste disposal and housekeeping in pre-processing areas. • Explain how process monitoring and control contribute to efficiency, yield, and product consistency. 	<ul style="list-style-type: none"> • Demonstrate the process for checking and verifying the weight and quality of received oilseeds by examining physical parameters such as appearance, colour, odour, and texture. • Demonstrate the process of transferring accepted raw materials to designated storage silos or bins following SOPs. • Display the correct method for setting up and assembling pre-processing equipment, ensuring correct alignment and safety compliance. • Operate cleaning machines to remove lighter impurities using air aspiration or sieving. • Carry out the de-stoning process to remove heavier impurities and collect cleaned materials. • Perform drying and cooling operations, adjusting temperature, airflow, and time to achieve the desired moisture content (6–8 %). • Operate cracking, de-hulling, and flaking machines and inspect flakes for uniform thickness and integrity. • Show how to adjust and monitor conditioning/cooking vessel parameters (temperature, pressure, time) to prepare

	<p>flakes for extraction.</p> <ul style="list-style-type: none"> • Perform basic corrective actions on identified operational issues (e.g., blockages, misalignment, variation in moisture) or escalate as per the defined reporting hierarchy. • Record process observations, equipment settings, and deviations in the production logbook as per documentation procedures.
Classroom Aids	
Participant handbook, Laptop with an internet connection, Whiteboard, Marker, Projector or large screen, Audio-visual equipment, Chart paper, PowerPoint presentation, Notebooks, Pens, etc.	
Tools, Equipment and Other Requirements	
Weighing scale, Moisture meter, Cleaning machine, De-stoner, Dryer unit, Cooling fan or blower, Cracking mill, De-hulling machine, Flaking machine, Conditioning or cooking vessel, Airflow meter, Thermometer, Steam generator, Storage bins, PPE kit (gloves, apron, mask, safety shoes, goggles), Sample oilseeds (peanut, sunflower, soybean, sesame), Waste collection bins, etc.	

Module 4: Carry Out Oil extraction by pressing method

Mapped to FIC/N1029, v3.0

Terminal Outcomes:

- Operate and control the screw press or traditional ghani to extract oil efficiently while maintaining process parameters and ensuring minimal residual oil content.
- Filter, collect, and store crude oil following quality, hygiene, and FSSAI-compliant procedures for further refining or packaging.
- Handle and utilise by-products such as oil cake/meal responsibly and perform calibration and safety checks to ensure smooth plant operation.

Duration: 5:00 (Hours)	Duration: 20:00 (Hours)
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Elaborate the pressing method of oil extraction. • Explain the working principles of different oil extraction systems, such as traditional ghani (cold press) and mechanical screw press. • Describe the process of feeding conditioned raw materials into the screw press or ghani and the factors affecting feed rate and efficiency. • Discuss critical parameters of oil pressing, such as screw speed, barrel temperature, and pressure, and their impact on oil yield and quality. • Discuss the physical and chemical characteristics of crude oil and oil cake obtained from pressing. • Describe the process of oil cake sampling to assess residual oil content and make necessary press adjustments. • Explain the procedures for oil clarification and filtration to remove suspended impurities before storage or refining. • Describe the quality control parameters for assessing crude oil (colour, odour, clarity, FFA levels) and the role of sampling for lab analysis. • Explain the standard procedures for storing extracted crude oil in accordance with organisational and FSSAI norms. • Describe the utilisation of by-products such 	<ul style="list-style-type: none"> • Demonstrate feeding of measured, conditioned raw materials into the screw press at a controlled rate. • Set and adjust screw press parameters such as speed, barrel temperature, and pressure for optimum oil extraction. • Operate and monitor the screw press or ghani machine, observing the flow and clarity of expelled oil. • Collect and assess pressed oil cake samples for residual oil content and temperature, and make necessary press adjustments. • Perform filtration of crude oil to remove suspended impurities and observe the difference between unfiltered and filtered oil. • Display methods for collecting and labelling representative samples of filtered oil to facilitate quality control testing and documentation. • Employ suitable techniques to transfer filtered crude oil safely to refining tanks or storage vessels following SOPs. • Demonstrate how to handle and segregate by-products, such as oil cake, for further processing or drying into animal feed. • Employ appropriate PPE and follow safety procedures during hot press operations and material handling. • Record and document press settings, oil

<p>as oil cake/meal for solvent extraction or as animal feed after drying and packing.</p> <ul style="list-style-type: none"> • Summarise key FSSAI and organisational laws related to raw materials, packaging materials, and product handling. • Identify various packaging materials and machinery used for crude oil and by-products. • Outline energy efficiency and environmental considerations (temperature control, waste minimisation, noise reduction) in pressing operations. 	<p>yield, and quality observations in the production logbook as per company format.</p>
<p>Classroom Aids</p>	
<p>Participant handbook, Laptop with an internet connection, Whiteboard, Marker, Projector or large screen, Audio-visual equipment, Chart paper, PowerPoint presentation, Notebooks, Pens, etc.</p>	
<p>Tools, Equipment and Other Requirements</p>	
<p>Screw press / mechanical expeller, Feed hopper, Filtration unit (plate or bag type), Collection tanks, Moisture meter, Pressure gauge, Temperature probe, Weighing balance, Calibration kit, Sample oilseeds (peanut, sunflower, soybean, sesame), Oil cake trays, Storage tanks, Sampling bottles, PPE (gloves, apron, safety shoes, goggles), etc.</p>	

Module 5: Carry out oil extraction by solvent extraction technique

Mapped to FIC/N1029, v3.0

Terminal Outcomes:

- Operate and control the solvent extraction process to obtain crude oil efficiently by maintaining process parameters and ensuring maximum solvent recovery.
- Show how to handle, recover, and store solvents safely following environmental, fire, and occupational safety standards.

Duration: 10:00 (Hours)	Duration: 20:00 (Hours)
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the principle of solvent extraction and differentiate it from mechanical pressing methods. • Describe the function and working of key solvent extraction equipment such as extractor, distillation system, desolventizer-toaster (DT), and solvent recovery units. • Explain the procedure for feeding flakes or oil cake/meal into the extractor and maintaining a uniform feed rate using conveyors and dampers. • Explain temperature and pressure control parameters in the extractor and distillation systems for efficient solvent recovery. • Describe the desolventization and toasting process for removing residual solvent and moisture from the spent meal. • Outline safety precautions for handling, storage, and recovery of solvents in compliance with fire and environmental norms. • Explain standard procedures for sampling crude oil and spent meal and forwarding samples to the quality control laboratory. • Describe storage requirements and SOPs for crude oil and desolventized meal. • Summarise the documentation process for recording yields, solvent recovery, and process parameters. • Identify relevant FSSAI and organisational regulations applicable to solvent extraction, product safety, and environmental control. 	<ul style="list-style-type: none"> • Demonstrate weighing of flakes or oil cake/meal and loading into the feeding hopper as per process requirements. • Adjust conveyor speed and extractor dampers to maintain a uniform feeding rate and bed height of material inside the extractor. • Perform spraying of solvent (e.g., hexane) and miscella on the material bed and conveyor screens to ensure efficient extraction and prevent clogging. • Operate extractor system and observe oil-rich miscella collection and separation of oil-free meal. • Show how to set and control temperature and pressure parameters in the distillation system for solvent recovery and oil separation. • Use a suitable technique to collect and test crude oil samples for clarity and quality before transferring to storage tanks. • Transfer spent meal to the desolventizer-toaster (DT) and adjust process parameters (temperature, steam pressure, rotation speed) to remove residual solvent. • Employ appropriate process to cool, pack, and store desolventized meal following SOPs and hygiene standards. • Apply safe handling practices for solvents during storage, recovery, and recycling

	<p>operations.</p> <ul style="list-style-type: none"> • Show how to record and document process parameters, yields, and solvent recovery data accurately as per traceability and reporting standards.
Classroom Aids	
<p>Participant handbook, Laptop with an internet connection, Whiteboard, Marker, Projector or large screen, Audio-visual equipment, Chart paper, PowerPoint presentation, Notebooks, Pens, etc.</p>	
Tools, Equipment and Other Requirements	
<p>Extractor unit, Distillation column with condenser, Desolventizer-toaster (DT), Solvent recovery system, Feed hoppers, Storage tanks for miscella and crude oil, Solvent spray nozzles, Temperature and pressure gauges, Solvent safety cabinet, Fire extinguisher, Spill control kit, Weighing balance, PPE kit (gloves, mask, apron, safety shoes, goggles), Sampling bottles, Documentation logbooks, etc.</p>	

Module 6: Perform cold press oil extraction

Mapped to FIC/N1029, v3.0

Terminal Outcomes:

- Plan, prepare, and carry out cold press oil extraction operations using appropriate equipment and parameters.
- Maintain hygiene, safety, and quality standards during seed handling, machine operation, oil collection, filtration, packaging, and storage as per organizational procedures and food safety regulations.

Duration: 5:00 (Hours)	Duration: 10:00 (Hours)
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the importance of selecting high-quality oilseeds for cold press oil extraction. • Describe types of oilseeds and their oil yield characteristics. • Explain the principle and operation of cold press machines (screw press, hydraulic press, wooden ghani). • State the importance of controlling temperature (below 40–50°C) to preserve oil quality. • Discuss process parameters such as pressure, feed rate, and temperature during cold pressing. • Explain differences between cold press and mechanical/solvent extraction methods. • Describe safety and hygiene requirements in the cold press extraction area. • Describe contamination risks and methods to handle oil and oilcake hygienically. • Explain filtration methods (gravity filtration, fine cloth filtering) used for removing sediments. • State proper storage conditions and food-grade materials for storing and packaging cold-pressed oil. • Explain the significance of following personal hygiene and safety measures while working in the extraction unit. 	<ul style="list-style-type: none"> • Show how to segregate high-quality oilseeds (e.g., sesame, mustard, groundnut, coconut) suitable for cold pressing. • Inspect oilseeds for impurities, moisture content, and foreign particles using standard tools and visual checks. • Demonstrate cleaning and drying of oilseeds before extraction. • Show how to set up and align components of the cold press machine (hopper, pressing chamber, outlet) as per SOP. • Apply appropriate technique to adjust machine parameters like pressure, speed, and feed rate to ensure efficient extraction. • Show how to feed cleaned and measured oilseeds into the cold press machine and operate it safely. • Monitor the extraction process, ensuring oil temperature does not exceed the set limit. • Display the process to collect raw oil in clean stainless steel containers and avoid contamination. • Perform filtration of crude oil using gravity or cloth filters. • Employ appropriate technique to separate and store oilcake/by-products for further utilization (animal feed or

	<p>manure).</p> <ul style="list-style-type: none"> • Transfer filtered oil to food-grade stainless steel or glass containers. • Show how to label and package oil as per food safety and regulatory standards (e.g., FSSAI). • Demonstrate the procedure of storing packaged oil in a dark, cool place to prevent oxidation. • Conduct simple quality checks on oil for colour, aroma, and clarity. • Record process data such as batch number, yield, temperature, and filtration details. • Clean and sanitize the cold press machine and tools after each batch. • Show how to dispose of waste and maintain cleanliness of the work area as per SOP.
Classroom Aids	
Participant handbook, Laptop with an internet connection, Whiteboard, Marker, Projector or large screen, Audio-visual equipment, Chart paper, PowerPoint presentation, Notebooks, Pens, etc.	
Tools, Equipment and Other Requirements	
Cold Press Machine (Screw Press / Hydraulic Press / Wooden Ghani), Moisture Meter, Weighing Balance (Digital), Filtration Setup (Gravity Filter / Fine Cloth Filter / Filter Press), Stainless Steel Oil Collection Containers, Thermometer (Digital or Infrared), Funnels (Food Grade), Waste Bins with Lids, pH Strips, Personal Protective Equipment (PPE), etc.	

Module 7: Refine oil using various methods

Mapped to FIC/N1030, v2.0

Terminal Outcomes:

- Perform preparatory activities for carrying out the oil refining process.
- Discuss various tasks related to degumming and bleaching of extracted oil.
- Demonstrate the methods to perform dewaxing of extracted oil
- Describe the methods to perform de-odorising the oil.
- Perform post-production tasks such as packaging, storing, cleaning and maintenance.

Duration: 60:00 (Hours)	Duration: 50:00 (Hours)
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the overall oil refining process, including degumming, neutralisation, bleaching, dewaxing/winterisation, and deodorisation, as per organisational workflow. • Describe the purpose and sequence of operations in chemical and physical refining methods and compare their advantages and limitations. • Discuss the role and composition of crude oil impurities (phosphatides, FFA, pigments, waxes, volatile compounds) that need to be removed. • Explain the chemical reactions involved in degumming and neutralisation using phosphoric acid, citric acid, and caustic lye. • Describe the operating principles, components, and control parameters of refining equipment such as heat exchangers, centrifuges, vacuum dryers, bleachers, economisers, crystallisers, and de-odourizers. • Explain the significance of vacuum drying and moisture removal for oil stability and the prevention of oxidation. • Describe the bleaching process and explain the roles of bleaching earth and activated carbon in removing colour and trace impurities. • Explain filtration mechanisms and methods 	<ul style="list-style-type: none"> • Demonstrate the setting and operation of the heat exchanger to heat crude oil to the specified temperature and pressure. • Perform degumming and neutralisation by adding controlled quantities of acids and alkalis under supervision. • Show separation of gums and soap stock using a centrifuge and subsequent water washing process. • Operate the vacuum dryer to remove residual moisture from neutralised oil and record readings. • Apply bleaching process parameters by heating oil, adding bleaching earth, and monitoring filtration in leaf filters. • Demonstrate the polishing of bleached oil and its collection into designated tanks, including quality verification. • Conduct dewaxing/winterisation by cooling, agitation, and filtration to obtain clear oil. • Operate deodorisation system (economiser, vacuum pump, steam line) to remove odour and free fatty acids. • Use PLC controls to monitor temperature, pressure, and retention time during different refining stages. • Take and label representative samples of refined oil for laboratory testing. • Employ proper PPE and safety measures

for oil–earth separation and polishing.

- Describe dewaxing/winterisation principles, including controlled cooling and crystallisation for oil clarity.
- Discuss the role of propylene glycol cooling systems, agitation control, and filtration in dewaxing.
- Explain the deodorisation process, which utilises steam distillation and vacuum to remove free fatty acids and odorous substances.
- Describe temperature and pressure management to ensure quality retention during deodorisation.
- Elucidate the process of adding antioxidants before final filtration and packaging to improve shelf life.
- Identify the quality control parameters and physical properties (colour, odour, viscosity, density, moisture content, FFA%) for refined oil.
- Explain sampling procedures for in-process and finished products as per SOP.
- Describe packaging, labelling, and coding operations — including fill volume, batch numbering, and expiry date coding.
- Explain documentation protocols for recording batch details, yields, traceability data, and quality results for audits.
- Discuss preventive maintenance, lubrication, and cleaning schedules for refining equipment.
- Outline FSSAI, BIS, and organisational standards governing edible oil refining, hygiene, and food safety.
- Explain environmental and safety practices for handling chemicals, hot oil, and waste generated during refining.
- Discuss the importance of PLC (Programmable Logic Controller) integration for monitoring and controlling refining operations.
- Summarise basic troubleshooting methods for common issues like incomplete degumming, poor bleaching, residual odour,

when handling chemicals, steam, or hot oil systems.

- Perform the addition of antioxidants and final filtration before packaging.
- Use filling, sealing, labelling, and coding machines to pack refined oil into pouches, tins, or bottles.
- Record process parameters, batch numbers, yields, and QC results in the production logbook.
- Develop process flow documentation and traceability charts for audit readiness.
- Conduct cleaning and sanitisation of work areas and equipment using approved agents.
- Carry out periodic preventive maintenance tasks, such as filter replacement, calibration of gauges, and checking oil seals.
- Role-play reporting non-conformities, deviations, or equipment faults to supervisors and quality departments.
- Demonstrate waste segregation and safe disposal of spent bleaching earth and other by-products.
- Show energy-efficient practices, such as the reuse of heat and water, to reduce process waste.
- Demonstrate teamwork, communication, and reporting mechanisms used within production and quality departments.

or wax haze. <ul style="list-style-type: none"> • Discuss sustainability practices such as solvent recovery, reuse of spent bleaching earth, and energy-efficient heat exchange. 	
Classroom Aids	
Participant handbook, Laptop with an internet connection, Whiteboard, Marker, Projector or large screen, Audio-visual equipment, Chart paper, PowerPoint presentation, Notebooks, Pens, etc.	
Tools, Equipment and Other Requirements	
Heat exchanger, Centrifuge, Vacuum dryer, Bleacher, Pressure leaf filter, Economiser, Crystalliser, De-odourizer, Steam generator, Condenser, Agitator, Cooling tower, Filling and labelling machine, Temperature & pressure gauges, Moisture and viscosity meters, Antioxidant dosing unit, Sampling bottles, PPE kit (gloves, aprons, goggles, safety shoes), Fire extinguisher, Cleaning agents, etc.	

Module 8: Practice personal hygiene and follow Good Manufacturing Practices at workplace

Mapped to FIC/N9906, v1.0

Terminal Outcomes:

- Discuss the importance of personal hygiene and GMP at the workplace.
- Demonstrate the tasks to be performed for ensuring personal hygiene and GMP practices at the workplace.

Duration: 05:00 (Hours)	Duration: 10:00 (Hours)
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • 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 site-relevant documented procedure for Personal Hygiene and Visitor/ Contractor rules • Explain work instructions at all levels inside a food manufacturing site • Ensure timed planning and participation of relevant training and awareness sessions on personal hygiene, GMP and related topics • Explain the importance of timely medical examination from a prescribed and authorised doctor, and to comply with the guidelines of Schedule IV as described in the Food Safety Standard Authority of India (FSSAI) guidelines • State how to follow a site-relevant documented procedure and area-wise work instructions for Good Manufacturing Practices (GMP) to be followed on the site • List validated Do's & Don'ts inside a food manufacturing firm • State process flow charts, HACCP summary plan and critical process parameters in each and respective areas of the production line • Explain how to identify the material requirements, such as manufacturing equipment, Utensils and other processing aids, 	<ul style="list-style-type: none"> • Demonstrate the steps to be performed for implementing good manufacturing practices (GMP) • Demonstrate how to follow work instructions at all levels of employees inside a food manufacturing site and ensure that the relevant instructions are well communicated and followed within the fixed timelines • Show how to fill in the data in the daily monitoring checklist related to personal hygiene, food safety and GMP • Illustrate the process to follow for man and materials movement throughout the production facility, to restrict unwanted hazards from cross-contaminating the products that are being manufactured in the facility • Show how to tag and number all the equipment, machinery, tools, and other processing aids to keep a proper traceability of the product being manufactured and handled at the site • Demonstrate the process of record keeping and documentation, including Daily Monitoring Sheets, Batch Traceability Records, machine records, product parameters, and process control parameters.

<p>cleaning chemicals, and cleaning work instructions in all the relevant areas of the manufacturing facility</p> <ul style="list-style-type: none"> • Define the Allergens, their risks and the allergen requirements • State the relevance of guidelines in the manufacturing area and how training evaluation will be implemented • Explain the process of audits and ways to address the aspects of Good Manufacturing Procedures, personal hygiene and food safety 	
Classroom Aids	
Participant handbook, Laptop with an internet connection, Whiteboard, Marker, Projector or large screen, Audio-visual equipment, Chart paper, PowerPoint presentation, Notebooks, Pens, etc.	
Tools, Equipment and Other Requirements	
PPE kit (gloves, aprons, goggles, safety shoes), soap dispenser, hand sanitiser, earplugs, masks, aprons/lab coats, eye protection, hard hats, rubber boots, etc.	

Module 9: Apply food safety practices at workplace

Mapped to FIC/N9906, v1.0

Terminal Outcomes:

- List the food safety practices at the workplace and the ways to implement them
- Demonstrate the steps to be followed to implement food safety procedures effectively.

Duration: 05:00 (Hours)	Duration: 10:00 (Hours)
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • 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 • Explain requirements to maintain updated facilities, equipment and tools to minimise the risks associated with the products being handled at the site • 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 • Discuss the significance of various types of hazard and safety signs • Explain FSSAI Schedule IV requirements related to: Pest Control, Cleaning and Sanitation, Utilities, Waste Disposal, Prevention of Cross Contamination, allergen management, corrective action, preventive actions, food operation control, etc. • Discuss the relevance of checking critical control points and product parameters. • Explain the importance of record keeping and documentation, including daily monitoring sheets, cleaning sheets, and parameters. • Discuss how to report any food safety and 	<ul style="list-style-type: none"> • Apply appropriate techniques to deal with hazards safely and appropriately • Perform steps for checking critical control points and product parameters • Show how to maintain accurate records and documentation, including daily monitoring sheets, cleaning sheets, and parameters. • Demonstrate appropriate ways to respond to an accident situation or medical emergency promptly and appropriately. • Perform the steps to be followed during the emergency and evacuation procedure.

GMP issues to the supervisor, if any	
Classroom Aids	
Participant handbook, Laptop with an internet connection, Whiteboard, Marker, Projector or large screen, Audio-visual equipment, Chart paper, PowerPoint presentation, Notebooks, Pens, etc.	
Tools, Equipment and Other Requirements	
GMP format and guidelines, allergen manual, personal hygiene guidelines, etc.	

Module 10: Employability Skills (30 Hours)

Mapped to DGT/VSQ/N0101, v1.0

Mandatory Duration: 30:00			
Location: On-Site			
S.No.	Module Name	Key Learning Outcomes	Duration (hours)
1.	Introduction to Employability Skills	<ul style="list-style-type: none"> Discuss the importance of Employability Skills in meeting the job requirements 	1 Hour
2.	Constitutional values - Citizenship	<ul style="list-style-type: none"> Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen. Show how to practice different environmentally sustainable practices 	1 Hour
3.	Becoming a Professional in the 21st Century	<ul style="list-style-type: none"> Discuss 21st century skills. Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mindset in different situations. 	1 Hour
4.	Basic English Skills	<ul style="list-style-type: none"> Use appropriate basic English sentences/phrases while speaking 	2 Hours
5.	Communication Skills	<ul style="list-style-type: none"> Demonstrate how to communicate in a well -mannered way with others. Demonstrate working with others in a team 	4 Hours
6.	Diversity & Inclusion	<ul style="list-style-type: none"> Show how to conduct oneself appropriately with all genders and PwD Discuss the significance of reporting sexual harassment issues in time 	1 Hour
7.	Financial and Legal Literacy	<ul style="list-style-type: none"> Discuss the significance of using financial products and services safely and securely. Explain the importance of managing expenses, income, and savings. Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws 	4 Hours
8.	Essential Digital Skills	<ul style="list-style-type: none"> Show how to operate digital devices and use the 	3 Hours

		associated applications and features, safely and securely <ul style="list-style-type: none"> Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely 	
9.	Entrepreneurship	<ul style="list-style-type: none"> Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges 	7 Hours
10.	Customer Service	<ul style="list-style-type: none"> Differentiate between types of customers Explain the significance of identifying customer needs and addressing them Discuss the significance of maintaining hygiene and dressing appropriately 	4 Hours
11.	Getting ready for apprenticeship & Jobs	<ul style="list-style-type: none"> Create a biodata Use various sources to search and apply for jobs Discuss the significance of dressing up neatly and maintaining hygiene for an interview Discuss how to search and register for apprenticeship opportunities 	2 Hours

List of Tools & Equipment for Employability Skills		
Sl No.	Name of the Equipment	Quantity
1.	Computer (PC) with latest configurations – and Internet connection with standard operating system and standard word processor and worksheet software (Licensed) (all software should either be the latest version or one/two versions below)	As required
2.	UPS	As required
3.	Scanner cum Printer	As required
4.	Computer Tables	As required
5.	Computer Chairs	As required
6.	LCD Projector	As required
7.	White Board 1200mm x 900mm	As required
Note: Above Tools & Equipment not required, if Computer LAB is available in the institute.		

Module 11: On-the-Job Training

Mapped to Oil Extraction and Refining Technician (FIC/Q1013, V1.0)

Mandatory Duration: 150:00	Recommended Duration: 00:00
Location: On-Site	
<ul style="list-style-type: none"> • Inspect and verify the quality of incoming raw materials (oilseeds) by assessing appearance, colour, odour, texture, and moisture content as per standard sampling and testing procedures. • Demonstrate correct methods of loading, transferring, and storing oilseeds in designated bins or silos following FIFO principles and storage SOPs. • Set up and operate cleaning, de-stoning, cracking, and de-hulling machines safely to ensure removal of foreign matter and consistent feed quality. • Perform oil extraction using screw press or <i>ghani</i> by maintaining optimal feed rate, barrel temperature, and screw speed to ensure maximum yield and safe operation. • Collect, observe, and analyse expelled oil and oil cake for physical characteristics (clarity, viscosity, and residual oil content) and make corrective adjustments as needed. • Set up and align components of the cold press machine (hopper, pressing chamber, outlet) as per SOP. • Demonstrate proper filtration and clarification of crude oil to remove suspended impurities before transferring to refining tanks. • Operate solvent extraction system (extractor, distillation, and desolventizer-toaster) maintaining temperature, pressure, and solvent recovery efficiency under supervision. • Apply solvent handling and recovery procedures using appropriate PPE and fire-safety protocols • Carry out degumming and neutralisation of crude oil by dosing acids and alkalis, operating centrifuge, and removing soap stock under controlled process conditions. • Demonstrate bleaching, filtration, and dewaxing operations using appropriate process parameters to improve oil clarity and stability. • Operate deodorisation equipment and vacuum systems to remove odorous compounds and free fatty acids, ensuring product meets quality norms. • Check and record refined oil characteristics (colour, odour, viscosity, and FFA %) and communicate deviations to the supervisor for corrective action. • Perform filling, sealing, labelling, and date-coding operations using packaging machines and verify that each unit meets company and FSSAI labelling standards. • Implement Good Manufacturing Practices (GMP) and hygiene protocols, including use of PPE, cleaning schedules, allergen control, and waste segregation, in the production area. • Conduct post-production cleaning of machinery, filters, and storage tanks using approved cleaning agents and follow lock-out/tag-out procedures during maintenance. • Assist in preventive maintenance by checking oil levels, belts, gaskets, gauges, and calibration of instruments under the guidance of the maintenance team. 	

Annexure

Trainer Requirements

Trainer Pre-requisites						
Minimum Educational Qualification	Specialisation	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialisation	Years	Specialisation	
B.Sc / B.Tech/BE	Food technology or food Engineering or Food Science or Oil Technology	3	Edible Oil processing or Industry	1	Food processing	
M.Sc/M.Tech/ME	Food technology or food Engineering or Food Science or Oil Technology	2	Edible Oil processing or Industry	1	Food processing	

Trainer Certification	
Domain Certification	Platform Certification
Certified for Job Role: "Oil Extraction and Refining Technician" mapped to QP: "FIC/Q1013, 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, v3.0". Minimum accepted score as per MEPSC guidelines is 80%.

Assessor Requirements

Assessor Pre-requisites						
Minimum Educational Qualification	Specialisation	Relevant Industry Experience		Assessor Experience		Remarks
		Years	Specialisation	Years	Specialisation	
B.Sc / B.Tech/BE	Food technology or food Engineering or Food Science or Oil Technology	4	Edible Oil processing or Industry	1	Food processing	
M.Sc/M.Tech/ME	Food technology or food Engineering or Food Science or Oil Technology	3	Edible Oil processing or Industry	1	Food processing	

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Assessor Certification	
Domain Certification	Platform Certification
Certified for Job Role: "Oil Extraction and Refining Technician" mapped to QP: "FIC/Q1013, v1.0". Minimum accepted score is 80%.	Recommended that the Trainer is certified for the Job Role: "Assessor", mapped to the Qualification Pack: "MEP/Q2701, v3.0". 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 authorised 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.

References

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 helps 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