





Model Curriculum

QP Name: Assistant Lab Technician-Food and Agricultural Commodities

QP Code: FIC/Q7601

QP Version:3.0

NSQF Level: 3

Model Curriculum Version: 3.0

Food Industry Capacity and Skill Initiative (FICSI)
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Training Parameters

Sector	Food Processing	
Sub-Sector	Multi-Sectorial	
Occupation	Quality Analysis/ Assurance	
Country	India	
NSQF Level	3	
Aligned to NCO/ISCO/ISIC Code	NCO-2004/3116.20	
Minimum Educational Qualification and Experience	 Grade 10 pass & Equivalent Grade 8 pass with three years of relevant experience in Food Industry/Lab Previous relevant Qualification of NSQF Level 2.5 – 1.5 year experience Previous relevant Qualification of NSQF Level 2 – 3 year relevant experience 	
Pre-Requisite License or Training	NA	
Minimum Job Entry Age	16 years	
Last Reviewed On	27/08/2024	
Next Review Date	26/08/2027	
NSQC Approval Date	27/08/2024	
QP Version	3.0	





Model Curriculum Creation Date	22/06/2024
Model Curriculum Valid Upto Date	26/08/2027
Model Curriculum Version	3.0
Minimum Duration of the Course	330 Hours
Maximum Duration of the Course	330 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:

- Prepare the lab for testing samples
- Sampling and quality analysis for food lab activities
- Apply food safety, and Hygiene in the laboratory
- Employability skills

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(M andatory)	On-the-Job Training Duration(Recom mended)	Total Duration
FIC/N7627 Prepare the lab for testing samples NOS Version No.:2.0 NSQFLevel:3.5	30:00 Hours	60:00 Hours	00:00Hours	00:00Hours	90:00 Hours
Module 1: Introduction to The training program	08:00 Hours	00:00 Hours	00:00 Hours	00:00Hours	08:00 Hours
Module 2: Prepare the lab for testing samples	22:00 Hours	60:00 Hours	00:00 Hours	00:00Hours	82:00 Hours
FIC/N7603 Perform Basic Sampling and Perform day-to-day lab activities NOS Version No: 2.0 NSQF Level: 3	30:00 Hours	90:00 Hours	0:00Hours	00:00Hours	120:00 Hours
Module 3: Carry out sampling and quality analysis for food lab activities	30:00 Hours	90:00 Hours	00:00 Hours	00:00Hours	120:00 Hours





FIC/N9907 Apply food safety and Maintain hygiene in the laboratory NOS Version No.:2.0 NSQF Level:3.5	10:00 Hours	20:00 Hours	00:00Hours	00:00Hours	30:00 Hours
Module 4: Food safety, hygiene in the Laboratory	10:00 Hours	20:00 Hours	00:00Hours	00:00Hours	30:00 Hours
On the Job Training	00:00	00:00	60:00Hours	00:00Hours	60:00Hours
DGT/VSQ/N0101: Employability Skills	12:00 Hours	18:00 Hours	00:00Hours	00:00Hours	30:00 Hours
Module 6: Employability Skills	12:00 Hours	18:00 Hours	00:00Hours	00:00Hours	30:00 Hours
Total Duration	82:00 Hours	188:00 Hours	60:00Hours	00:00Hours	330:00 Hours





Module Details

Module1: Introduction to the training program *Mapped to FIC/N7627, v1.0*

Terminal Outcomes:

- Describe food processing industry and its sub-sectors
- Discuss the opportunities available to Assistant lab technicians in food processing industry
- List the various tasks to be performed in the job

Duration:08:00	Duration:00:00
Theory–Key Learning Outcomes	Practical–Key Learning Outcomes
 Describe food processing industry and its sub-sectors. Discuss the future trends and career growth opportunities available to assistant lab technician in the food processing industry. Summarise the key roles and responsibilities of an 'Assistant Lab Technician. discuss the career options for an Assistant Lab Technician List the sequence of tasks performed by lab technicians in a food industry get familiarized with the equipments used in the food testing labs 	
Classroom Aids:	
Computer, Projection Equipment, Power Point Preser Participant's Handbook.	ntation and software, Facilitator's Guide,
Tools, Equipment and Other Requirements	
Nil	





Module 2: Prepare the lab for testing samples *Mapped to FIC/N7627, v1.0*

Terminal Outcomes:

- Organize lab to carry out testing of sample
- Receive/handle the samples for testing
- Carry out visual inspection of samples

Duration:22:00	Duration:60:00
Theory–Key Learning Outcomes	Practical–Key Learning Outcomes
 Discuss the techniques to maintain the cleanliness of the work area using approved sanitizers Explain the techniques followed to clean and sterilize the test equipment as per SOP Explain the importance of keeping the work area free from dust, pests, and flies Explain how to create a cleaning schedule Explain the importance of verifying the performance of lab equipment Explain the importance of maintaining the temperatures of freezers and refrigerators Discuss the types of glassware used in the lab Explain the procedure for cleaning and sterilizing glassware Explain the importance of proper sample handling to prevent contamination Discuss essential supplies needed for laboratory operations Discuss the principles of inventory management Explain the importance of adhering to safety protocols Describe common troubleshooting techniques and preventive maintenance practices Explain the basic principles of machine repair Explain the importance of verifying sample conditions upon receipt Discuss how to examine samples for labeling, seals, and physical conditions 	 Demonstrate the various tools used in the lab for testing food samples Demonstrate how to clean the work area and lab equipment to prepare for testing with the approved sanitizers and cleaning agents Show how to clean and sterilize glassware used in the lab Display the procedure to rectify faults and minor repairs in lab equipment/apparatus. Enumerate the essential supplies needed for lab operations Demonstrate the process of receiving samples and various checks Demonstrate inventory management using the software Show how to maintain the tools and machines/apparatus utilized for testing. Demonstrate the lab and personal safety protocols Demonstrate the visual inspection





- Discuss different types of products for eg plant-based food, animal-based food, state of maturity, use before date, etc received for testing
- Explain the criteria for examining the physical conditions of the samples received.
- Discuss the documentation process while receiving the samples
- Discuss the importance of the collection details on the samples and verifying them
- Discuss the storage environment and the storage parameters for the samples collected
- Discuss the various visual inspection techniques and paratmeters.

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Classroom Aids:

Computer ,Projection Equipment, Power Point Presentation and software, Facilitator's Guide, Participant's Handbook

Tools, Equipment and Other Requirements

Test Tubes, Round Bottom Flasks, Wire Gauges, Bunsen Burner, Mortar and Pestle, Funnels, Vernier Calipers, Beakers, Flasks, Oven Universal, Rectangular Muffle Furnace, pHMeter, Infrar ed Moisture Meter, Sieve Shaker, Autoclave, Weighing Balance, Magnetic Stirrer, Thermometer, Centrifuge, Hot Water Bath, Burette, Vacuum Drier, Colony Counter (Electronic Digital), B.O.D Incubator, Research Inclined Monocular Microscope, Soxhlet Extraction Unit, Round Heating Plate, Heating Mantles, Kjeld Hal Digestion Unit, Laminar Air Flow, Hand Refractometer, LPGCylinder, Protective Gloves, Head Caps, Lab Coat, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual





Module 3: Carry out sampling and quality analysis for food lab activities $Mapped\ to\ FIC/N7623,\ v2.0$

Terminal Outcomes:

• Sampling and quality analysis as per the specifications and standards of the organization.





- designated area
- Discuss the importance of storing samples at a suitable temperature Discuss the disposal methods of the samples received.
- Discuss the various steps in the waste disposal process and the documentation process
- Explain the neutralization of the wastes
- Discuss the Standard operating procedure for analysing the samples
- Discuss how the analyse the sample using the calibrated equipment
- explain the steps to perform a physical inspection of the food samples, checking appearance, size and shape, texture, weight, presence of foreign matter, and odor
- Explain and discuss the different types of physical tests that are done on the packaging material.
- Explain the maintenance procedures for cleaning and maintaining the various equipment used in the lab
- Explain the internal processes such as procurement, store management, inventory management, quality management and key contact points for query resolution
- Discuss food safety and hygiene standard
- Explain procedure for preparation of all reagents required for analysis of raw materials, packaging materials and finished productsExplain the frequency of the reagents produced
- Discuss the steps to enter sample

- visual inspection for checking the physical parameters of the sample checking appearance, size and shape, texture, weight, presence of foreign matter, and odor
- Demonstrate how to perform the test for packaging materials checking the printed matter and comparing with standard, checking the strength of cartons, etc for all samples collected





details used in production, control sample register and shelf-life sample register, in ERP

- Understand the sampling procedure and sampling frequency for production/process samples, shelflife studies samples
- Understand the basics of food microbiology lab
- Understand the inventory management system in ERP
- Discuss the procedures for storing, maintaining and disposing production control sample
- Explain CIP and COP cleaning procedures

Classroom Aids:

Computer, Projection Equipment, Power Point Presentation and software, Facilitator's Guide, Participant's Handbook

Tools, Equipment and Other Requirements

Test Tubes, Round Bottom Flasks, Wire Gauges, Bunsen Burner, Mortar and Pestle, Funnels, Vernier Calipers, Beakers, Flasks, Oven Universal, Rectangular Muffle Furnace, pH Meter, Infrared Moisture Meter, Sieve Shaker, Autoclave, Weighing Balance, Magnetic Stirrer, Thermometer, Centrifuge, Hot Water Bath, Burette, Vacuum Drier, Colony Counter (Electronic Digital), B.O.D Incubator, Research Inclined Monocular Microscope, Soxhlet Extraction Unit, Round Heating Plate, Heating Mantles, Kjeldahl Digestion Unit, Laminar Air Flow, Hand Refractometer, LPG Cylinder, Protective Gloves, Head Caps, Lab Coat, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual





Module 4: Apply food safety and hygiene in the food laboratory *Mapped to FIC/N9907, v2.0*

Terminal Outcomes:

• Apply & practice to maintain food safety and hygiene in the laboratory

Duration:10:00	Duration:20:00
Theory–Key Learning Outcomes	Practical-Key Learning Outcomes
 Discuss the food borne illness and the medical examination Discuss the latest updates in food safety regulations Discuss Material Safety Data Sheet(MSDS) and explain why is it essential in the food lab Explain contamination and degradation and explain why it is important to follow proper procedures for the collection, labeling, and storage of biological samples and to prevent contamination and degradation. Discuss how to segregate waste according to type (biological, chemical, sharps, general) and dispose of it in designated, labeled bins Explain cross contamination and measure to prevent them in samples Discuss the storage procedures adopted in the organisation considering the temperature and humidity factors Discuss the features of Good Laboratory Practices (GLP) to ensure high-quality and reliable lab results Explain the NABL and its functions Discuss the FSSAI guidelines for food labs 	 Enumerate the food safety regulations Create sample MSDS Demonstrate the waste segregation process Enumerate the Good Laboratory practices Demonstrate the troubleshooting techniques of working equipment Demonstrate the Good Hygiene practices while handling food samples in the food lab





- Discuss the Good Hygeine Practices while handling food samples
- Discuss food allergens and their management
- Discuss the minor issues of the working equipment and troubleshooting techniques
- Explain the importance of audits and discuss the documentation and record keeping mechanisms

Classroom Aids:

Computer, Projection Equipment, Power Point Presentation and software, Facilitator's Guide, Participant's Handbook

Tools, Equipment and Other Requirements

Test Tubes, Round Bottom Flasks, Wire Gauges, Bunsen Burner, Mortar and Pestle, Funnels, Vernier Calipers, Beakers, Flasks, Oven Universal, Rectangular Muffle Furnace, pH Meter, Infrared Moisture Meter, Sieve Shaker, Autoclave, Weighing Balance, Magnetic Stirrer, Thermometer, Centrifuge, Hot Water Bath, Burette, Vacuum Drier, Colony Counter (Electronic Digital), B.O.D Incubator, Research Inclined Monocular Microscope, Soxhlet Extraction Unit, Round Heating Plate, Heating Mantles, Kjeldahl Digestion Unit, Laminar Air Flow, Hand Refractometer, LPG Cylinder, Protective Gloves, Head Caps, Lab Coat, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual





Module 5: Asst Lab Technician -On the Job Training Mapped to FIC/Q7601 v3.0

Terminal Outcomes:

- Understand lab maintenance
- Understand the sampling analysis process
- Understand health and safety guidelines in the food testing labs

On the Job Training-

Mandatory Duration:<60 hrs>

Location: on site

- understand the organization's policies and procedures regarding lab maintenance
- Understand the tools used in testing food samples of various types
- Read the operating manual of the equipment
- Understand the working of the equipment involved in the food testing process
- Understand the safety procedures to be followed while working with the equipment as per the GHP guidelines
- Understand the process of receiving samples and storing them in the designated area
- Understand the method of entering the sample details in the ERP
- Understand the quality analysis of the samples received
- Understand the process of physical inspection of samples
- Understand the documentation of the entire process
- Understand the food safety and hygiene practices followed by the organization
- understand the cleaning and sanitizing the lab equipment
- understand the waste disposal measures adopted by the organization





Module 6: Employability and Entrepreneurship skills

Terminal Outcomes:

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

Duration:12:00	Duration:18:00
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 traits of effective time managers Discuss tips for stress management 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. 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 	 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 the procedure to apply for bank finances Demonstrate on how to identify new business opportunities Prepare a business plan and Detailed Project report (DPR) Prepare a sample plan to solve problems and improve productivity at the workplace. Demonstrate the procedure to operate a computer for digital marketing, ecommerce, branding, etc. Show how to use services such as NEFT, IMPS, UPI, RTGS for online banking. Prepare a detailed sample report consisting of information such as future investments, forecasting, business expansion, etc. Demonstrate the procedure to conduct an





business opportunities and increasing the clientele.

- Demonstrate how you will sell a product or service on an e-commerce platform with integration of payment gateway
- Demonstrate a case study of a successful entrepreneur

Classroom Aids

Computer, Projection Equipment, Power Point Presentation and software, Facilitator's Guide, Participant's Handbook.

Tools, Equipment and Other Requirements

Nil





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	2	Food processing	1	Food processing	
M.Sc/M.Tech/ME	Food technology or food engineering	1	Food processing	1	Food processing	
Diploma /certificate course	Food Technology / Food Engineering /packaging/Ho me science, Milling technology or allied sector	3	Food processing	1	Food processing	

Trainer Certification			
Domain Certification	Platform Certification		
Certified for Job Role: "Assistant lab Technician" mapped to QP: "FIC/Q7601,v3.0". 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: "Assistant lab Technician "mapped to QP: "FIC/Q7601, v3.0". 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 empaneled 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. ThereineachPerformanceCriteriaintheNOSwillbeassignedmarksfortheoryand/orpractical 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 (i)True /False Statements (ii) Multiple Choice Questions(iii) 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
CIP	Clean-In Place