Model Curriculum

QP Name: Cold Storage Technician

QP Code: FIC/Q7004

QP Version: 1.0

NSQF Level: 3

Model Curriculum Version: 1.0

Food Industry Capacity and Skill Initiative (FICSI)
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Training Parameters

Sector	Food Processing
Sub-Sector	Multi-sectorial
Occupation	Refrigeration
Country	India
NSQF Level	3
Aligned to NCO/ISCO/ISIC Code	NCO-2004/NIL
Minimum Educational Qualification and Experience	1. Class 12th passed in science stream 2. Class 10th passed and 2 years course in relevant stream 3. Class 10th passed and 2 years of relevant experience 4. Class 10th pass and 2 years of ITI in relevant stream
Pre-Requisite License or Training	Not Applicable
Minimum Job Entry Age	18 years
Last Reviewed On	30/07/2021
Next Review Date	30/07/2024
NSQC Approval Date	NA
QP Version	1.0
Model Curriculum Creation Date	23/08/2015
Model Curriculum Valid Up to Date	30/07/2024
Model Curriculum Version	1.0
Minimum Duration of the Course	280 Hours + 40 OJT
Maximum Duration of the Course	280 Hours + 40 OJT

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 work area for cold storage of food product.
- Handle cold storage facility.
- Perform documentation and record keeping related to cold storage.
- Demonstrate the maintenance of hygiene and sanitation related to cold storage of food product.

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
Introduction to the sector and the job	**07:30 Hours**	**10:30 Hours**	**00:00 Hours**	**00:00 Hours**	**18:00 Hours**
Module 1: Introduction to the Training Program and Overview of Food Processing Industry	02:00 Hours	00:00 Hours	00:00 Hours	00:00 Hours	02:00 Hours
Module 2: Professional and Core Skills	05:30 Hours	10:30 Hours	00:00 Hours	00:00 Hours	16:00 Hours
FIC/N7010 Prepare and maintain work area and refrigeration requirements NOS Version No.: 1.0 NSQF Level: 4	**16:00 Hours**	**30:00 Hours**	**00:00 Hours**	**00:00 Hours**	**46:00 Hours**
Module 3: Prepare and maintain work area and refrigeration equipment	16:00 Hours	30:00 Hours	00:00 Hours	00:00 Hours	46:00 Hours
FIC/N7011 Handle cold storage facility for storing food NOS Version No.: 1.0 NSQF Level: 4	**39:00 Hours**	**50:00 Hours**	**00:00 Hours**	**00:00 Hours**	**89:00 Hours**
Module 4: Handle cold storage facility for storing food	27:00 Hours	40:00 Hours	00:00 Hours	00:00 Hours	67:00 Hours
Module 5: Organizational standards and norms	12:00 Hours	10:00 Hours	00:00 Hours	00:00 Hours	22:00 Hours
FIC/N7012 Complete documentation and record keeping related to the cold storage facility NOS Version No.: 1.0 NSQF Level: 4	**16:00 Hours**	**26:00 Hours**	**00:00 Hours**	**00:00 Hours**	**42:00 Hours**
Module 6: Complete documentation and record	08:00 Hours	06:00 Hours	00:00 Hours	00:00 Hours	14:00 Hours

keeping related to the cold storage facility					
Module 7: IT Orientation	08:00 Hours	20:00 Hours	00:00 Hours	00:00 Hours	28:00 Hours
FIC/N9003 Food safety, hygiene and sanitation for storage **NOS Version No.: 1.0** **NSQF Level: 4**	**20:00 Hours**	**25:00 Hours**	**00:00 Hours**	**00:00 Hours**	**45:00 Hours**
Module 8: Food Safety, Hygiene and Sanitation	20:00 Hours	25:00 Hours	00:00 Hours	00:00 Hours	45:00 Hours
Employability and Entrepreneurship skills	**28:00 Hours**	**12:00 Hours**	**00:00 Hours**	**00:00 Hours**	**40:00 Hours**
Module 9: Employability and Entrepreneurship skills	28:00 Hours	12:00 Hours	00:00 Hours	00:00 Hours	40:00 Hours
Total Duration	**126:30 Hours**	**153:30 Hours**	**00:00 Hours**	**00:00 Hours**	**280:00 Hours**

Module Details

Module 1: Introduction to the training program and overview of food processing industry
Bridge Module

Terminal Outcomes:

- Discuss the opportunities available for cold storage technician in food processing industry.

Duration: *02:00*	**Duration**: *00:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Define Food Processing. - List the various sub sectors of food processing industry. - List the need for storage of food products. - List the various methods of food preservation. - List the advantages of cold storage of food products. - List the various units within a cold storage plant.	
Classroom Aids:	
White board/Chart papers, marker.	
Tools, Equipment and Other Requirements	
Nil	

Module 2: Professional and Core Skills
Bridge Module

Terminal Outcomes:

- Discuss the attributes of desirable professional behaviour.
- Demonstrate the standard measures undertaken for working effectively.

Duration: *05:30*	Duration: *10:30*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Identify personal strengths and weaknesses. - State the importance of decision making in the job. - State the importance of communicating effectively. - State the importance of listening. - State the importance of reading skills.	- Apply standard practice to undertake a self-assessment test for identifying strengths and weaknesses. - Plan and prioritise tasks effectively to ensure timely completion. - Demonstrate the ways to analyse situations for identifying problems and making sound decision promptly.
Classroom Aids:	
Laptop, white/black board, marker, chart papers, projector, Trainer's guide, Student manual.	
Tools, Equipment and Other Requirements	
NIL	

Module 3: Prepare and maintain work area and refrigeration equipments
Mapped to FIC/N7010 v1.0

Terminal Outcomes:

- Discuss the tasks to be performed to prepare for cold storage.
- State the importance of maintaining tools and equipment effectively.

Duration: *16:00*	**Duration**: *30:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• State the materials and equipment used in the cleaning and maintenance of the work area. • State the common detergents and sanitizers used in cleaning work area and machineries. • State the methods of cleaning and sanitization. • State the different types of maintenance procedures.	• Demonstrate attending minor repairs and faults in process machineries. • Prepare the machines and tools required for production.

Classroom Aids:
Laptop, white board, marker, chart papers, projector, trainer's guide, student handbook.

Tools, Equipment and Other Requirements
Compressor, Condenser, Evaporator, Fans, Sensors, Thermostat, Humidity Meter, Protective Gloves, Head Caps, Lab Coat, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual.

Module 4: Handle cold storage facility for storing food
Mapped to FIC/N7011 v1.0

Terminal Outcomes:

- Discuss about handling cold storage facility for storing food
- Demonstrate the standard practices followed for handling cold storage.

Duration: *27:00*	**Duration**: *40:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- List the various parts of the refrigeration system correctly. - Explain how to analyze the refrigerant used in the system. - List the control parameters required like the temperature range, atmosphere, storage time at a given temperature.	- Carryout check if all the machineries are clean and in good working conditions. - Demonstrate the installation of refrigeration system. - Carryout a pre startup check. - Demonstrate the starting up of the refrigeration system. - Demonstrate the setting of machines according to control parameters. - Demonstrate the storing of food products. - Demonstrate the monitoring of machineries during storage. - Demonstrate the recording of parameters in storage chart until storage period. - Inspect, repair/replace refrigeration system and components. - Demonstrate how to maintain the entire system and its components.
Classroom Aids:	
Laptop, white board, marker, chart papers, projector, trainer's guide and student handbook.	
Tools, Equipment and Other Requirements	
Compressor, Condenser, Evaporator, Fans, Sensors, Thermostat, Humidity Meter, Protective Gloves, Head Caps, Lab Coat, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual.	

Module 5: Organizational standards and norms
Mapped to FIC/N7011 v1.0

Terminal Outcomes:

- Discuss the roles and responsibilities of a cold storage technician.
- Describe importance of personal hygiene and sanitation.

Duration: *12:00*	Duration: *10:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- State the roles and responsibilities of a cold storage technician. - State how to conduct yourself at the workplace. - State the personal hygiene and sanitation guidelines. - State the food safety and hygiene standards to follow in an organization.	- Demonstrate how to conduct yourself at the workplace. - Demonstrate the procedure to be followed to implement personal hygiene and sanitation guidelines at the workplace.
Classroom Aids:	
Laptop, white board, marker, chart papers, projector, business plan, trainer's guide and student manual.	
Tools, Equipment and Other Requirements	
Protective gloves, head caps, lab coat, safety goggles, safety boots, mouth masks, sanitizer, food safety manual.	

Module 6: Complete documentation and record keeping related to the cold storage facility
Mapped to FIC/N7012 v1.0

Terminal Outcomes:

- Document and maintain records related to cold storage facility.

Duration: 08:00	Duration: 06:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Explain the need for documenting and maintaining records of raw materials, processes and finished products. - Discuss the method of documenting and recording the details of raw material to final finished product.	Demonstrate the process of documenting records of production plan, process parameters, and finished product.
Classroom Aids:	
Laptop, white board, marker, chart papers, projector, trainer's guide and student handbook.	
Tools, Equipment and Other Requirements	
Food safety manual, Log Books.	

Module 7: IT Orientation
Mapped to FIC/N7012 v1.0

Terminal Outcomes:

- List the parts of a computer.
- Demonstrate the effective use of data recording applications at the workplace.

Duration: *08:00*	Duration: *20:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
 - State the basic functionalities of the computer to perform day to day activities. - List the various parts of a computer. - Describe the functions of different computer devices. - List the various applications used in recording information.	 - Identify parts of computer. - Demonstrate the standard techniques used to operate a computer. - Show how to use an ERP software for recording information. - Demonstrate the effective use of applications such as word processor and spreadsheets. - Demonstrate how to use the computer to document dayto-day activities.
Classroom Aids:	
Laptop, white board, marker, chart papers, projector, trainer's guide and student handbook.	
Tools, Equipment and Other Requirements	
NIL	

Module 8: Food and Safety, Hygiene and Sanitation for Storage
Mapped to FIC/N9003 v1.0

Terminal Outcomes:

- Discuss the importance of health and safety at the workplace.
- Demonstrate the task to be performed for ensuring health and safety at the workplace.

Duration: *20:00*	Duration: *25:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Explain the importance of safety, hygiene and sanitation in the storage industry. - List the various types of hazards.	- Apply personal hygiene practices by using of gloves, hairnet, mask, ear plug, goggles, shoes etc. - Inspect raw material, ingredients and finished products to ensure safe food. - Apply GMP, GHP, HACCP and product recall practices. - Role play of hazard management techniques. - Demonstrate how to analyze the quality of produce by smell, appearance, taste and take measures to prevent spoilage. - Demonstrate stock rotation based on FEFO/FIFO.
Classroom Aids:	
Laptop, white board, marker, chart papers, projector, trainer's guide and student handbook.	
Tools, Equipment and Other Requirements	
Protective gloves, head caps, aprons, safety goggles, safety boots, mouth covers, sanitizer, food safety manual, logbooks etc.	

Module 9 : Employability and Entrepreneurship skills

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	- 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.

- 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
- 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:

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

Tools, Equipment and Other Requirements

Nil

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification *<Select the minimum educational requirements, such as 12th Pass, Graduate or NSQF certified.>*	**Specialization** *<Specify the areas of specialization that are desirable.>*	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	*Specialization*	*Years*	*Specialization*	
M.Sc/ M.Tech/ ME	Food Technology or Food Engineering	2	Food Industry	1	Training of Cold Storage Technician	
B.Sc or Graduate / B.Tech/ BE	Food Technology or Food Engineering	3	Food Industry	1	Training of Cold Storage Technician	
B.Sc	Food Science and Quality Control	4	Food Industry	1	Training of Cold Storage Technician	
Diploma	Food Technology or Food Engineering	4	Food Industry	1	Training of Cold Storage Technician	
Diploma/Certificate course	Cold Storage	5	Food Industry	1	Training of Cold Storage Technician	

Trainer Certification	
Domain Certification	**Platform Certification**
Certified for Job Role: "Cold Storage Technician" mapped to QP: "FIC/Q7004 v1.0". Minimum accepted score is 80%	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MEP/Q0102". Minimum accepted score is 80 % as per FICSI guidelines.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification *<Select the minimum educational requirements, such as 12th Pass, Graduate or NSQF certified.>*	**Specialization** *<Specify the areas of specialization that are desirable.>*	**Relevant Industry Experience**		**Training/Assessment Experience**		**Remarks**
		Years	*Specialization*	*Years*	*Specialization*	
B.SC	Hotel Management or Food Technology or Home Science or Post Harvest Management	5	Food Industry	3	Assessment of Cold Storage Technician	
Diploma	Hotel Management or Food Technology or Home Science or Post Harvest Management	5	Food Industry	3	Assessment of Cold Storage Technician	

Assessor Certification	
Domain Certification	**Platform Certification**
Certified for Job Role: "Cold Storage Technician" mapped to QP: "FIC/Q7004 v1.0". Minimum accepted score is 80%	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MEP/Q0102". Minimum accepted score is 80 % as per FICSI guidelines.

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 (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 behavioral 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
HACCP	Hazard Analysis and Critical Control Points
GMP	Good Manufacturing Practices
GHP	Good Hygiene Practices