



Model Curriculum

QP Name: Squash and Juice Processing Technician

QP Code: FIC/Q0101

QP Version: 1.0

NSQF Level: 3

Model Curriculum Version: 1.0

Food Industry Capacity and Skill Initiative (FICSI)
Shriram Bhartiya Kala Kendra (3rd Floor)
Copernicus Marg, New Delhi 110001

Phone: 9711260230

Table of Contents

Training Parameters.....	3
Program Overview	4
Compulsory Modules	5
Module Details.....	7
Module 1: Introduction to the training program and overview of the food processing industry.....	7
Module 2: Professional and Core Skills.....	8
Module 3: Prepare and maintain work area and process machineries for squash and juice processing	9
Module 4: Prepare for production of squash and juice	10
Module 5: Produce squash and juice.....	12
Module 6: Food microbiology.....	14
Module 7: Organizational standards and norms	15
Module 8: Complete documentation and record keeping	16
Module 9: IT Orientation	17
Module 10: Food and safety, hygiene and sanitation	18
Module 11 : Employability and Entrepreneurship skills	19
Annexure.....	20
Trainer Requirements	20
Assessor Requirements.....	22
Assessment Strategy	23
Glossary.....	24
Acronyms and Abbreviations.....	24

Training Parameters

Sector	Food Processing
Sub-Sector	Fruits and Vegetables
Occupation	Processing
Country	India
NSQF Level	3
Aligned to NCO/ISCO/ISIC Code	NCO-2004/7414.90
Minimum Educational Qualification and Experience	<ol style="list-style-type: none"> 1. Class 10th passed with 1 year of relevant experience 2. Class 8th passed with 1 year of relevant experience
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	30/07/2021
Model Curriculum Valid Up to Date	30/07/2024
Model Curriculum Version	1.0
Minimum Duration of the Course	280 + 200 OJT Hours
Maximum Duration of the Course	280 + 200 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:

- Prepare and maintain work area and process machineries for squash and juice processing.
- Prepare for production of squash and juice.
- Produce squash and juice.
- Document and maintain record related to production of squash and juice.
- Follow and maintain food safety and hygiene in the work environment.

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	34:00 Hours	18:00 Hours	00:00 Hours	00:00 Hours	52:00 Hours
Module 1: Introduction to the training program and overview of the food processing industry	02:00 Hours	00:00 Hours	00:00 Hours	00:00 Hours	02:00 Hours
Module 2: Professional and Core Skills	04:00 Hours	06:00 Hours	00:00 Hours	00:00 Hours	10:00 Hours
Module 11: Employability and Entrepreneurship skills	28:00 Hours	12:00 Hours	00:00 Hours	00:00 Hours	40:00 Hours
FIC/N0101 Prepare and maintain work area and process machineries for squash and juice processing NOS Version No.: 1.0 NSQF Level: 4	08:00 Hours	15:00 Hours	00:00 Hours	00:00 Hours	23:00 Hours
Module 3: Prepare and maintain work area and process machineries for squash and juice processing	08:00 Hours	15:00 Hours	00:00 Hours	00:00 Hours	23:00 Hours
FIC/N0102 Prepare for production of squash and juice NOS Version No.: 1.0 NSQF Level: 4	10:00 Hours	20:00 Hours	00:00 Hours	00:00 Hours	30:00 Hours
Module 4: Prepare for production of squash and juice	10:00 Hours	20:00 Hours	00:00 Hours	00:00 Hours	30:00 Hours
FIC/N0103 Produce squash and juice NOS Version No.: 1.0 NSQF Level: 4	33:00 Hours	58:00 Hours	00:00 Hours	00:00 Hours	91:00 Hours
Module 5: Produce squash and juice	19:00 Hours	40:00 Hours	00:00 Hours	00:00 Hours	59:00 Hours

5 | Squash and Juice Processing Technician

Module 6: Food microbiology	06:00 Hours	08:00 Hours	00:00 Hours	00:00 Hours	14:00 Hours
Module 7: Organizational standards and norms	08:00 Hours	10:00 Hours	00:00 Hours	00:00 Hours	18:00 Hours
FIC/N0104 Complete documentation and record keeping related to production of squash and juice NOS Version No.: 1.0 NSQF Level: 4	18:00 Hours	21:00 Hours	00:00 Hours	00:00 Hours	39:00 Hours
Module 8: Complete documentation and record keeping	12:00 Hours	06:00 Hours	00:00 Hours	00:00 Hours	18:00 Hours
Module 9: IT orientation	06:00 Hours	15:00 Hours	00:00 Hours	00:00 Hours	21:00 Hours
FIC/N9001 Food safety, hygiene and sanitation for processing food product NOS Version No.: 1.0 NSQF Level: 3	15:00 Hours	30:00 Hours	00:00 Hours	00:00 Hours	45:00 Hours
Module 10: Food safety, hygiene and sanitation	15:00 Hours	30:00 Hours	00:00 Hours	00:00 Hours	45:00 Hours
Total Duration	118:00 Hours	162:00 Hours	00:00 Hours	00:00 Hours	280:00 Hours

Module Details

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

Bridge Module

Terminal Outcomes:

- Discuss the food processing industry in brief.
- List the opportunities available to squash and juice processing technician in the food industry.

Duration: 02:00	Duration: 00:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss how to introduce each other and build rapport with fellow participants and the trainer. • List the various subsectors of food processing industry. • Define fruits and vegetables Processing. • State the need for fruits and vegetables processing. • Define squash and juice processing. • Explain how to identify nature and availability of job opportunities. • List various subsectors of beverage industry • List the various fruit drinks. • Define fruit juice and its types. • List the various fruits used for making squash and juice. 	
Classroom Aids:	
NIL	
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: 04:00	Duration: 06:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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:	
NIL	
Tools, Equipment and Other Requirements	
NIL	

Module 3: Prepare and maintain work area and process machineries for squash and juice processing

Mapped to FIC/N0101 v1.0

Terminal Outcomes:

- Prepare work area and process machineries required for squash and juice processing.

Duration: 08:00	Duration: 15:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • State the materials and equipment used in cleaning and maintenance of the work area and machineries. • State the cleaning processes used to clean the work area. 	<ul style="list-style-type: none"> • Identify different equipment used in squash and juice processing. • Demonstrate the use of different tools and machineries used for squash and juice. • Demonstrate the appropriate method for cleaning and maintaining a work area to ensure the work area is safe and hygienic for food processing. • Identify the set of machines and tools required for production. • Practice cleanliness of the process machineries required for production using recommended sanitizers.
Classroom Aids:	
NIL.	
Tools, Equipment and Other Requirements	
Thermometer (Digital), Beakers, Measuring Cylinder, Measuring Flask, Weighing Balance (Digital), Brix Meter/ Refractometer, Fruit Tray, Cutting Knives, Mixer/Electric Mixer, Fruit Slicing Machine, Pulper, Peeler, Steam Jacketed Kettle, Slicer, Pasteurizer, Sterilizer, Clarifier, Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Safety Manual.	

Module 4: Prepare for production of squash and juice

Mapped to FIC/N0102 v1.0

Terminal Outcomes:

- Discuss how to plan production schedule and sequence, organize raw materials.
- Define the methods used for storing the raw materials for later use.

Duration: 10:00	Duration: 20:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • State how to plan the production schedule as per organizational standards and instructions • Discuss how to organize the raw materials, packaging materials, manpower, equipment and machineries for the scheduled production • State the methods for storing raw materials for later use • State how to plan the production sequence to maximize capacity, utilization of resources, manpower and machinery • Explain how to calculate batch size and prioritize urgent orders based on the production schedule and machine capacity • Discuss how to organize quality raw material as per production process and company standards • Explain about preparation of the raw material for production • List the effect of manhandling of fruits on juice. 	<ul style="list-style-type: none"> • Use basic mathematics for various calculations in day-to-day processes • Identify the raw materials required for production as per production schedule and formation • Inspect the conformance of raw material quality to company standards • Check the raw material quality and grade.
Classroom Aids:	
NIL	

Tools, Equipment and Other Requirements

Thermometer (Digital), Beakers, Measuring Cylinder, Measuring Flask, Weighing Balance (Digital), Brix Meter/ Refractometer, Fruit Tray, Cutting Knives, Mixer/Electric Mixer, Fruit Slicing Machine, Pulper, Peeler, Steam Jacketed Kettle, Slicer, Pasteurizer, Sterilizer, Clarifier, Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Safety Manual.

Module5: Produce squash and juice

Mapped to FIC/N0103 v1.0

Terminal Outcomes:

- Demonstrate the processing of squash and juice.
- Demonstrate the method of clarifying fruit juice and packaging.

Duration: 19:00	Duration: 40:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the processing of Squash and Juice. • State the procedures used to extract the fruit and vegetable juice/pulp. • Describe enzyme activity in fruit processing. • State the procedure for preparing juice and squash. • Describe pasteurization process for fruit juice. • Describe sterilization process for fruit juice. • State the methods of sterilizing fruit juice. • List the quality parameters of squash and juice. • Explain aseptic packaging in fruit processing industry. • State the methods for storing raw materials for later use. • Explain the process of storing packaged fruit pulp. • State the process of maintaining storage conditions as per organizational standards. • State kinds of waste produced and its disposal. 	<ul style="list-style-type: none"> • Demonstrate the pre-extraction processes of fruits. • Demonstrate the method of clarifying fruit juice. • Demonstrate the process of packaging squash and juice. • Demonstrate the process of cleaning the work area and machines after production.
Classroom Aids:	
NIL	

Tools, Equipment and Other Requirements

Thermometer (Digital), Beakers, Measuring Cylinder, Measuring Flask, Weighing Balance (Digital), Brix Meter/ Refractometer, Fruit Tray, Cutting Knives, Mixer/Electric Mixer, Fruit Slicing Machine, Pulper, Peeler, Steam Jacketed Kettle, Slicer, Pasteurizer, Sterilizer, Clarifier, Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Safety Manual.

Module6: Food microbiology

Mapped to FIC/N0103 v1.0

Terminal Outcomes:

- State the cause, process and criteria to check for food spoilage.
- Discuss different types of food preservation processes.

Duration: 06:00	Duration: 08:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • State the type of food microbes. • Explain the cause of food spoilage. • State the process for food spoilage. • Explain the criteria to check food spoilage. • State the need for food preservation. • Explain different types of food preservation processes. • Explain the method of assessing the quality of produce based on physical parameters. 	<ul style="list-style-type: none"> • Identify the cause of food spoilage. • Demonstrate how to check food spoilage.
Classroom Aids:	
NIL	
Tools, Equipment and Other Requirements	
Samples of fresh and spoiled food.	

Module 7: Organizational standards and norms

Mapped to FIC/N0103 v1.0

Terminal Outcomes:

- Discuss the roles and responsibilities of a packing machine worker.
- Describe importance of personal hygiene and sanitation.

Duration: 08:00	Duration: 10:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • State the roles and responsibilities of a squash and juice processing 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. 	<ul style="list-style-type: none"> • 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:	
NIL	
Tools, Equipment and Other Requirements	
Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Safety Manual.	

Module 8: Complete documentation and record keeping

Mapped to FIC/N0104 v1.0

Terminal Outcomes:

- Document and maintain records related to squash and juice processing.

Duration: 12:00	Duration: 06:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> State the need for documenting and maintaining records of raw materials, processes and finished products. State the method of documenting and recording the details of raw material to final finished product. 	<ul style="list-style-type: none"> Demonstrate the process of documenting records of production plan, process parameters, and finished products.
Classroom Aids:	
NIL	
Tools, Equipment and Other Requirements	
Food safety manual, Log books.	

Module 9: IT Orientation

Mapped to FIC/N0104 v1.0

Terminal Outcomes:

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

Duration: 06:00	Duration: 15:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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:	
Computer/Laptop.	
Tools, Equipment and Other Requirements	
NIL	

Module 10: Food and safety, hygiene and sanitation

Mapped to FIC/N9001 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: 15:00	Duration: 30:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • State the importance of safety, hygiene and sanitation in the food industry. • Discuss about the industry standards to maintain a safe and hygiene workplace. 	<ul style="list-style-type: none"> • Demonstrate the safety practices to be followed in the work area. • Demonstrate the personal hygiene to be followed in the work area. • Apply HACCP principles to eliminate food safety hazards in the process and products.
Classroom Aids:	
NIL	
Tools, Equipment and Other Requirements	
Protective gloves, head caps, aprons, safety goggles, safety boots, mouth covers, sanitizer, safety manual, logbooks etc.	

Module 11 : 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
<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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.

<p>opportunities, generate employment and increase clientele.</p> <ul style="list-style-type: none"> • 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:	
White board/Chart papers, marker.	
Tools, Equipment and Other Requirements	
NIL	

Annexure

Trainer Requirements

Trainer Prerequisites				
Minimum Educational	Specialization <i><Specify the areas of</i>	Relevant Industry Experience	Training Experience	Remarks

Qualification <Select the minimum educational requirements, such as 12 th Pass, Graduate or NSQF certified.>	<i>specialization that are desirable.></i>	Year s	Specialization	Ye ar s	Specialization	
M. Sc./M.Tech/ME	Food Technology or Food Engineering	2	Food Industry	1	Training of Squash and Juice Processing Technician	
B.Sc or graduate/ B.Tech/BE	Food Technology or Food Engineering	3	Food Industry	1	Training of Squash and Juice Processing Technician	
B.SC	Food Science and Quality Control	4	Food Industry	1	Training of Squash and Juice Processing Technician	
B.Sc	Home Science	5	Food Industry	1	Training of Squash and Juice Processing Technician	
Diploma/ Certificate course	Hotel Management/ Fruits and Vegetable Processing	5	Food Industry	1	Training of Squash and Juice Processing Technician	
Diploma	Food Technology or Food Engineering or Catering Technology	4	Food Industry	1	Training of Squash and Juice Processing Technician	

Trainer Certification	
Domain Certification	Platform Certification
Certified for Job Role: "Squash and Juice Processing Technician" mapped to QP: "FIC/Q0101, 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 <i><Select the minimum educational requirements, such as 12th Pass, Graduate or NSQF certified.></i>	Specialization <i><Specify the areas of specialization that are desirable.></i>	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
B.Sc	Hotel Management/ Food Technology/ Home Science/Post Harvest Management	5	Food Industry	3	Assessment of Squash and Juice Processing Technician	
Diploma	Hotel Management/ Food Technology/ Home Science/Post Harvest Management	5	Food Industry	3	Assessment of Squash and Juice Processing Technician	

Assessor Certification	
Domain Certification	Platform Certification
Certified for Job Role: "Squash and Juice Processing Technician" mapped to QP: "FIC/Q0101, 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