

# LEARNING OUTCOMES BASED CURRICULUM

## JOB ROLE: ICE CREAM PROCESSING TECHNICIAN

(Ref. ID: FIC/Q2004)

Sector: Food Processing

### Grades 11 and 12

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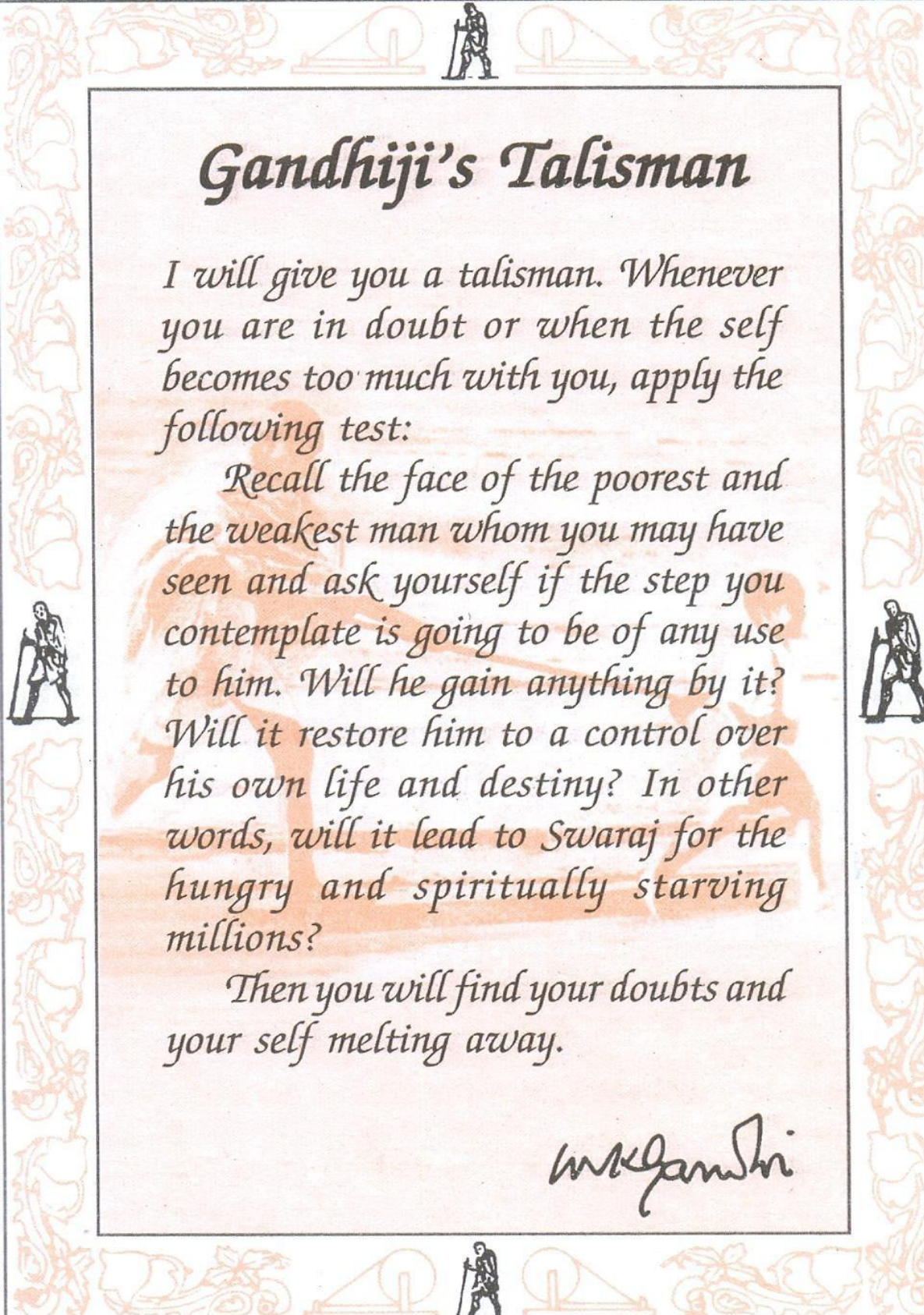
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NCERT

**PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION**

(a constituent unit of NCERT, under Ministry of Education, Government of India)

Shyamla Hills, Bhopal- 462 002, Madhya Pradesh, India

<http://www.psscive.ac.in>



## Gandhiji's Talisman

*I will give you a talisman. Whenever you are in doubt or when the self becomes too much with you, apply the following test:*

*Recall the face of the poorest and the weakest man whom you may have seen and ask yourself if the step you contemplate is going to be of any use to him. Will he gain anything by it? Will it restore him to a control over his own life and destiny? In other words, will it lead to Swaraj for the hungry and spiritually starving millions?*

*Then you will find your doubts and your self melting away.*

*M.K. Gandhi*

# LEARNING-OUTCOMES BASED CURRICULUM

**JOB ROLE: ICE CREAM PROCESSING TECHNICIAN**

(QUALIFICATION PACK: Ref. Id. FIC/Q2004)

**Grades 11 & 12**



**PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION**

**Shyamla Hills, Bhopal- 462 002, Madhya Pradesh, India**

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**LEARNING OUTCOMES BASED VOCATIONAL  
CURRICULUM,  
Food Processing,  
Ice Cream Processing Technician,  
July, 2023**

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<http://www.psscive.ac.in>

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# FOREWORD

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The Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE), a constituent unit of National Council of Educational Research and Training (NCERT) is spearheading the efforts of developing learning outcome based vocational curriculum and courseware aimed at integrating both vocational and general qualifications to open pathways of career progression for students. It is a part of Vocationalisation of Education under Samagra Shiksha. The PSS Central Institute of Vocational Education (PSSCIVE) is developing curricula under the project approved by the Project Approval Board (PAB) of Samagra Shiksha of Ministry of Human Resource Development (MHRD), Govt. of India.

The main purpose of the learning outcome-based curricula is to bring about the improvement in teaching-learning process and working competences through learning outcomes embedded in the vocational subject. It is a matter of great pleasure to introduce this learning outcome-based curriculum as part of the vocational training packages for the job role of "Ice Cream Processing Technician". The curriculum has been developed for the secondary students of vocational education and is aligned to the National Occupation Standards (NOSs) of a job role identified and approved under the National Skill Qualification Framework (NSQF). The curriculum aims to provide children with employability and vocational skills to support occupational mobility and lifelong learning. It will help them to acquire specific occupational skills that meet employers' immediate needs. The teaching process is to be performed through the interactive sessions in classrooms, practical activities in laboratories and workshops, projects, field visits, and professional experiences. The curriculum has been developed and reviewed by a group of experts and their contributions are greatly acknowledged. The utility of the curriculum will be adjudged by the qualitative improvement that it brings about in teaching-learning. The feedback and suggestions on the content by the teachers and other stakeholders will be of immense value to us in bringing about further improvement in this document.

**Dinesh Prasad Saklani**  
**Director,**  
**National Council of Education Research and Training,**  
**New Delhi**

# PREFACE

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India today stands poised at a very exciting juncture in its saga. The potential for achieving inclusive growth are immense and the possibilities are equally exciting. The world is looking at us to deliver sustainable growth and progress. To meet the growing expectations, India will largely depend upon its young workforce. The much-discussed demographic dividend will bring sustaining benefits only if this young workforce is skilled and its potential is channelized in the right direction.

In order to fulfill the growing aspirations of our youth and the demand of skilled human resource, the Ministry of Human Resource Development (MHRD), Government of India introduced the revised Centrally Sponsored Scheme of Vocationalisation of Secondary and Higher Secondary Education that aims to provide for the diversification of educational opportunities so as to enhance individual employability, reduce the mismatch between demand and supply of skilled manpower and provide an alternative for those pursuing higher education. For spearheading the scheme, the PSS Central Institute of Vocational Education (PSSCIVE) was entrusted the responsibility to develop competency-based curricula, student workbooks, teacher handbooks and e-learning materials for the job roles in various sectors, with growth potential for employment.

The PSSCIVE firmly believes that the vocationalisation of education in the nation needs to be established on a strong footing of philosophical, cultural and sociological traditions and it should aptly address the needs and aspirations of the students besides meeting the skill demands of the industry. The curriculum, therefore, aims at developing the desired professional, managerial and communication skills to fulfill the needs of the society and the world of work. In order to honour its commitment to the nation, the PSSCIVE has initiated the work on developing learning outcome-based curricula with the involvement of faculty members and leading experts in respective fields. It is being done through the concerted efforts of leading academicians, professionals, policy makers, partner institutions, Vocational Education and Training experts, industry representatives, and teachers. The expert group through a series of consultations, working group meetings and use of reference materials develops a National Curriculum. Currently, the Institute is working on developing curricula and courseware for over 50 job roles in various sectors, besides the curricula developed for 100 job roles

We extend our gratitude to all the contributors for selflessly sharing their precious knowledge, acclaimed expertise, and valuable time and positively responding to our request for development of curriculum. We are grateful to MHRD and NCERT for the financial support and cooperation in realising the objective of providing competency based modular curricula and courseware to the States and other stakeholders under the PAB (Project Approval Board) approved project of *Samagra Shiksha* of Ministry of Human Resource Development (MHRD), Government of India.

Finally, for transforming the proposed curriculum design into a vibrant reality, all the institutions involved in the delivery system shall have to come together with a firm commitment and they should secure optimal community support. The success of this curriculum depends upon its effective implementation and it is expected that the managers of vocational education and training system, including subject teachers will make efforts to create better facilities, develop linkages with the world of work and foster a conducive environment as per amendments made in the curriculum document.

The PSSCIVE, Bhopal remains committed in bringing about reforms in the vocational education system through the learner-centric curricula and courseware. We hope that this document will prove useful in turning out more competent Indian workforce for the 21<sup>st</sup> century.

**Deepak Paliwal**  
**Joint Director**  
**PSS Central Institute of Vocational Education**  
**Bhopal**

# ACKNOWLEDGEMENTS

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On behalf of the team at the PSS Central Institute of Vocational Education (PSSCIVE) we are grateful to the members of the Project Approval Board (PAB) of *Samagra Shiksha* and the officials of the Ministry of Education (MoE), Government of India for the financial support to the project for development of curricula.

We are grateful to the Director, National Council for Education, Research and Training (NCERT) for his support and guidance. We also acknowledge the contributions of our colleagues at the Technical Support Group of *Samagra Shiksha*, MoE, National Skill Development Agency (NSDA) and National Skill Development Corporation (NSDC) and Food Industry Capacity Initiatives of India (FICSI) for their academic support and cooperation in the development of curricula.

We are also grateful to Dr. R. Ravichandran, Course Coordinator, Dr. Preeti Dixit and Dr. Jayshree Mahapatra, Assistant Professor, Department of Humanities, Sciences, Education and Research, PSSCIVE, Bhopal, and the experts Er. Anand Kishore, Assistant Professor, NIFTEM, Haryana and Mr. Shafat Khan, Deputy Manager - Curriculum Design and Development, Sector Skill Council for Food Processing (FICSI), New Delhi for their contributions in the development of this learning outcome-based curricula for the Job Role: Ice Cream Processing Technician for Grades 11 and 12.

The contributions made by Dr. Vinay Swarup Mehrotra and his team, at PSSCIVE in the development of the curriculum for the Employability Skills (Part-A) are also duly acknowledged.

**PSSCIVE Team**



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# 1. COURSE OVERVIEW

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## **COURSE TITLE: ICE CREAM PROCESSING TECHNICIAN**

An Ice Cream Processor is responsible for performing processing operations to prepare different types of ice creams and operate various types of equipment while maintaining consistency and quality. S/he is able to work with various organisational departments effectively and use resources at the workplace optimally.

An Ice Cream Processor must have the ability to plan, organize, prioritize, calculate and handle pressure. S/he must possess reading, writing and communication skills. In addition, the individual must have stamina to be able to stand for long hours, have personal and professional hygiene and an understanding of food safety standards and requirements.

**COURSE OBJECTIVES:** On completion of the course, students should be able to:

- Apply effective oral and written communication skills to interact with people and customers;
- Identify the principal components of a computer system;
- Demonstrate the basic skills of using computer;
- Demonstrate self-management skills;
- Demonstrate the ability to provide a self-analysis in context of entrepreneurial skills and abilities;
- Demonstrate the knowledge of the importance of green skills in meeting the challenges of sustainable development and environment protection;
- Perform various tasks related to the processing of milk and keeping the quality of milk intact
- Describe different types of ingredients and their role in various formulations of ice creams
- Describe the procedure to produce different types of ice creams
- Perform various tasks to prepare for production of ice creams
- Apply necessary health and safety practices to ensure food safety and personal hygiene

**COURSE REQUIREMENTS:** The learner should have a basic knowledge of dairy science/ food science

**COURSE LEVEL:** On completion of this course, a student can take up a higher-level course for a job role in ice cream processing, and can work in the dairy industry.

**COURSE DURATION: 600 hrs.**

Class11 : 300 hrs.  
Class12 : 300 hrs.

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**Total : 600 hrs.**

## 2. SCHEME OF UNITS AND ASSESSMENT

This course is a planned sequence of instructions consisting of Units meant for developing employability and vocational competencies of students of Grades 11 and 12, opting for vocational subject along with general education subjects. The unit-wise distribution of hours and marks for Grade 11 is as follows:

<b>GRADE 11</b>			
	<b>Units</b>	<b>No. of Hours for Theory and Practical 300</b>	<b>Max. Marks for Theory and Practical 100</b>
<b>Part A</b>	<b>Employability Skills</b>		
	Unit 1:Communication Skills – III	25	<b>10</b>
	Unit 2:Self-management Skills – III	25	
	Unit 3:Information and Communication Technology Skills – III	20	
	Unit 4: Entrepreneurial Skills – III	25	
	Unit 5: Green Skills – III	15	
	<b>Total</b>	<b>110</b>	<b>10</b>
<b>Part B</b>	<b>Vocational Skills</b>		
	Unit 1: Introduction to Food Processing	14	<b>40</b>
	Unit 2: Dairy Processing	48	
	Unit 3:Elements of Ice Cream Processing	43	
	Unit4: Basics of Ice Cream Production	40	
	Unit 5:Food Safety and Hygiene	20	
	<b>Total</b>	<b>165</b>	
<b>Part C</b>	<b>Practical Work</b>		
	Practical Examination	06	15
	Written Test	01	10
	Viva Voce	03	10
	<b>Total</b>	<b>10</b>	<b>35</b>
<b>Part D</b>	<b>Project Work/Field Visit</b>		
	Practical File/Student Portfolio	10	10
	Viva Voce	05	05
	<b>Total</b>	<b>15</b>	<b>15</b>
	<b>Grand Total</b>	<b>300</b>	<b>100</b>

The unit-wise distribution of hours and marks for Grade 12 is as follows:

<b>GRADE 12</b>			
	<b>Units</b>	<b>No. of Hours for Theory and Practical 300</b>	<b>Max. Marks for Theory and Practical 100</b>
<b>Part A</b>	<b>Employability Skills</b>		
	Unit 1: Communication Skills – IV	25	<b>10</b>
	Unit 2: Self-management Skills – IV	25	
	Unit 3: Information and Communication Technology Skills – IV	20	
	Unit 4: Entrepreneurial Skills – IV	25	
	Unit 5: Green Skills – IV	15	
	<b>Total</b>	<b>110</b>	<b>10</b>
<b>Part B</b>	<b>Vocational Skills</b>		
	Unit 1: Overview of Ice Cream Industry	25	
	Unit 2: Ice Creams and Frozen Desserts	60	<b>40</b>
	Unit 3: Production of Ice Creams	45	
	Unit 4: Food Preservation	15	
	Unit 5: Marketing of Ice Creams and Frozen Desserts	20	
	<b>Total</b>	<b>165</b>	
<b>Part C</b>	<b>Practical Work</b>		
	Practical Examination	06	15
	Written Test	01	10
	Viva Voce	03	10
	<b>Total</b>	<b>10</b>	<b>35</b>
<b>Part D</b>	<b>Project Work/Field Visit</b>		
	Practical File/Student Portfolio	10	10
	Viva Voce	05	05
	<b>Total</b>	<b>15</b>	<b>15</b>
	<b>Grand Total</b>	<b>300</b>	<b>100</b>

### 3. TEACHING/TRAINING ACTIVITIES

The teaching and training activities have to be conducted in classroom, laboratory/ workshops and field visits. Students should be taken to field visits for interaction with experts and to expose them to the various tools, equipment, materials, procedures and operations in the workplace. Special emphasis should be laid on the occupational safety, health and hygiene during the training and field visits.

#### CLASSROOM ACTIVITIES

Classroom activities are an integral part of this course and interactive lecture sessions, followed by discussions should be conducted by trained vocational teachers. Vocational teachers should make effective use of a variety of instructional aids, such as audio-video materials, colour slides, charts, diagrams, models, exhibits, hand-outs, online teaching materials, etc. to transmit knowledge and impart training to the students.

## **PRACTICAL WORK IN LABORATORY/WORKSHOP**

Practical work may include but not limited to hands-on-training, simulated training, role play, case-based studies, exercises, etc. Equipment and supplies should be provided to enhance hands-on learning experience of students. Only trained personnel should teach specialized techniques. A training plan that reflects tools, equipment, materials, skills and activities to be performed by the students should be submitted by the vocational teacher to the Head of the Institution.

## **FIELD VISITS/ EDUCATIONAL TOUR**

In field visits, children will go outside the classroom to obtain specific information from experts or to make observations of the activities. A checklist of observations to be made by the students during the field visits should be developed by the Vocational Teachers for systematic collection of information by the students on the various aspects. Principals and Teachers should identify the different opportunities for field visits within a short distance from the school and make necessary arrangements for the visits. At least three field visits should be conducted in a year.

## **4. ASSESSMENT AND CERTIFICATION**

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Upon successful completion of the course by the candidate, the Central/ State Examination Board for Secondary Education and the respective Sector Skill Council will certify the competencies.

The National Skills Qualifications Framework (NSQF) is based on outcomes referenced to the National Occupation Standards (NOS's), rather than inputs. The NSQF level descriptors, which are the learning outcomes for each level, include the process, professional knowledge, professional skills, core skills and responsibility. The assessment is to be undertaken to verify that individuals have the knowledge and skills needed to perform a particular job and that the learning programme undertaken has delivered education at a given standard. It should be closely linked to certification so that the individual and the employer could come to know the competencies acquired through the vocational subject or course. The assessment should be reliable, valid, flexible, convenient, cost effective and above all it should be fair and transparent. Standardized assessment tools should be used for assessment of knowledge of students. Necessary arrangements should be made for using technology in assessment of students.

### **KNOWLEDGE ASSESSMENT (THEORY)**

**Knowledge Assessment** should include two components: one comprising of internal assessment and second an external examination, including theory examination to be conducted by the Board. The assessment tools shall contain components for testing the knowledge and application of knowledge. The knowledge test can be objective paper-based test or short structured questions based on the content of the curriculum.

### **WRITTEN TEST**

It allows candidates to demonstrate that they have the knowledge and understanding of a given topic. Theory question paper for the vocational subject should be prepared by the subject experts comprising group of experts of academicians, experts from existing vocational subject experts/teachers, subject experts from university/colleges or industry. The respective Sector Skill Council should be consulted by the Central/State Board for preparing the panel of experts for question paper setting and conducting the examinations.

The blue print for the question paper may be as follows:

**Duration: 3hrs**

S. No.	Typology of Question	No. of Questions			Marks
		Very Short Answer (1 mark)	Short Answer (2 Marks)	Long Answer (3 Marks)	
1.	Remembering – (Knowledge based simple recall questions, to know specific facts, terms, concepts, principles, or theories; identify, define or recite, information)	2	1	2	10
2.	Understanding – (Comprehension – to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase, or interpret information)	1	2	2	11
3.	Application – (Use abstract information in concrete situation, to apply knowledge to new situations: Use given content to interpret a situation, provide an example, or solve a problem)	0	1	1	05
4.	High Order Thinking Skills – (Analysis & Synthesis – Classify, compare, contrast, or differentiate between different pieces of information; Organize and/ or integrate unique pieces of information from a variety of sources)	0	1	0	02
5.	Evaluation – (Appraise, judge, and/or justify the value or worth of a decision or outcome, or to predict outcomes based on values)	0	1	0	02
	<b>Total</b>	3x1=3	6x2=12	5x3=15	30 (14 Question)

**SKILL ASSESSMENT (PRACTICAL)**

Assessment of skills by the students should be done by the assessors/examiners on the basis of practical demonstration of skills by the candidate, using a competency checklist. The competency checklist should be developed as per the National Occupation Standards (NOS's) given in the Qualification Pack for the Job Role to bring about necessary consistency in the quality of assessment across different sectors and Institutions. The student has to demonstrate competency against the performance criteria defined in the National Occupation Standards and the assessment will indicate that they are 'competent', or are 'not yet competent'. The assessors assessing the skills of the students should possess a current experience in the industry and should have undergone an effective training in assessment principles and practices. The Sector Skill Councils should ensure that the assessors are provided with the training on the assessment of competencies.

Practical examination allows candidates to demonstrate that they have the knowledge and understanding of performing a task. This will include hands-on practical exam and viva voce. For practical, there should be a team of two evaluators – the subject teacher and the expert from the relevant industry certified by the Board or concerned Sector Skill Council. The same team of examiners will conduct the viva voce.

**Project Work** (individual or group project) is a great way to assess the practical skills on a certain time period or timeline. Project work should be given on the basis of the capability of the individual to perform the tasks or activities involved in the project. Projects should be discussed in the class and the teacher should periodically monitor the progress of the project and provide feedback for improvement and innovation. Field visits should be organized as part of the project work. Field visits can be followed by a small-group work/project work. When the class returns from the field visit, each group might be asked to use the information that they have gathered to prepare presentations or reports of their observations. Project work should be assessed on the basis of practical file or student portfolio.

**Student Portfolio** is a compilation of documents that supports the candidate's claim of competence.

Documents may include reports, articles, photos of products prepared by students in relation to the unit of competency.

**Viva voce** allows candidates to demonstrate communication skills and content knowledge. Audio or video recording can be done at the time of viva voce. The number of external examiners would be decided as per the existing norms of the Board and these norms should be suitably adopted/adapted as per the specific requirements of the vocational subject. Viva voce should also be conducted to obtain feedback on the student's experiences and learning during the project work/field visits.

## 5. UNIT CONTENTS

### GRADE 11

#### Part A: Employability Skills

S.No.	Units	Duration (hrs)
1.	Communication Skills- III	25
2.	Self-management Skills – III	25
3.	Information and Communication Technology Skills - III	20
4.	Entrepreneurial Skills – III	25
5.	Green Skills – III	15
	<b>Total</b>	<b>110</b>

#### UNIT 1: COMMUNICATION SKILLS – III

Learning Outcome	Theory (10hrs)	Practical (15hrs)	Duration (25 hrs)
1. Demonstrate knowledge of communication	1. Introduction to communication 2. Importance of communication 3. Elements of communication 4. Perspectives in communication 5. Effective communication	1. Role-play on the communication process 2. Group exercise on factors affecting perspectives in communication 3. Classroom discussion on the 7Cs of effective communication 4. Chart making on elements of communication	03
2. Demonstrate verbal communication	1. Verbal communication 2. Public Speaking	1. Role-play of a phone conversation. 2. Group exercise on public speaking	02

3. Demonstrate non-verbal communication	<ol style="list-style-type: none"> <li>1. Importance of non-verbal communication</li> <li>2. Types of non-verbal communication</li> <li>3. Visual communication</li> </ol>	<ol style="list-style-type: none"> <li>1. Role-play on non-verbal communication</li> <li>2. Group exercise on body language</li> <li>3. Group activity on methods of communication</li> </ol>	02
4. Speak using correct pronunciation	<ol style="list-style-type: none"> <li>1. Pronunciation basics</li> <li>2. Speaking properly</li> <li>3. Phonetics</li> <li>4. Types of sounds</li> </ol>	<ol style="list-style-type: none"> <li>1. Group activities on practicing pronunciation</li> </ol>	01
5. Apply an assertive communication style	<ol style="list-style-type: none"> <li>1. Important communication styles</li> <li>2. Assertive communication</li> <li>3. Advantages of assertive communication</li> <li>4. Practicing assertive communication</li> </ol>	<ol style="list-style-type: none"> <li>1. Group discussion on communication styles</li> <li>2. Observing and sharing communication styles</li> </ol>	03
6. Demonstrate the knowledge of saying no	<ol style="list-style-type: none"> <li>1. Steps for saying 'No'</li> <li>2. Connecting words</li> </ol>	<ol style="list-style-type: none"> <li>1. Group discussion on how to respond</li> <li>2. Group activity on saying 'No'</li> </ol>	02
7. Identify and use parts of speech in writing	<ol style="list-style-type: none"> <li>1. Capitalisation</li> <li>2. Punctuation</li> <li>3. Basic parts of speech</li> <li>4. Supporting parts of speech</li> </ol>	<ol style="list-style-type: none"> <li>1. Group activity on identifying parts of speech</li> <li>2. Writing a paragraph with punctuation marks</li> <li>3. Group activity on constructing sentences</li> <li>4. Group activity on identifying parts of speech</li> </ol>	03
8. Write correct sentences and paragraphs	<ol style="list-style-type: none"> <li>1. Parts of a sentence</li> <li>2. Types of object</li> <li>3. Types of sentences</li> <li>4. Paragraph</li> </ol>	<ol style="list-style-type: none"> <li>1. Activity on writing sentences</li> <li>2. Activity on active and passive voice</li> <li>3. Assignment on types of sentences</li> </ol>	02



9. Communicate with people	1. Greetings 2. Introducing self and others	1. Role-play on formal and informal greetings 2. Role-play on introducing someone 3. Practice greetings	02
10. Introduce yourself to others and write about oneself	1. Talking about self 2. Filling a form	1. Practice self-introduction and filling up forms 2. Practice self-introduction to others	01
11. Develop questioning skill	1. Main types of questions 2. Forming closed and open-ended questions	1. Practice exercise on forming questions 2. Group activity on framing questions	01
12. Communicate information about family to others	1. Names of relatives 2. Relations	1. Practice talking about family 2. Role-play on relations	01
13. Describe habits and routines	1. Concept of habits and routines	1. Discuss habits and routines 2. Group activity on describing routines	01
14. Ask or give directions to others	1. Asking for directions 2. Using landmarks	1. Role-play on asking and giving directions 2. Identifying symbols	01
<b>Total</b>			<b>25</b>

<b>UNIT 2: SELF-MANAGEMENT-III</b>			
<b>Learning Outcome</b>	<b>Theory (10hrs)</b>	<b>Practical (15hrs)</b>	<b>Duration (25hrs)</b>
1. Identify and analyze own strengths and weaknesses	1. Understanding self 2. Techniques for identifying strengths and weaknesses 3. Difference between interests and abilities	1. Activity on writing aims in life 2. Prepare a worksheet on interests and abilities	03
2. Demonstrate personal grooming skills	1. Guidelines for dressing and grooming 2. Preparing a personal grooming checklist	1. Activity on dressing and grooming standards 2. Self-reflection on dressing and grooming	04

3. Maintain personal hygiene	<ol style="list-style-type: none"> <li>1. Importance of personal hygiene</li> <li>2. Three steps to personal hygiene</li> <li>3. Essential steps of hand washing</li> </ol>	<ol style="list-style-type: none"> <li>1. Role-play on personal hygiene</li> <li>2. Assignment on personal hygiene</li> </ol>	03
4. Demonstrate the knowledge of working in a team and participating in group activities	<ol style="list-style-type: none"> <li>1. Describe the benefits of teamwork</li> <li>2. Working in a team</li> </ol>	<ol style="list-style-type: none"> <li>1. Assignment on working in a team</li> <li>2. Self-reflection on teamwork</li> </ol>	03
5. Develop networking skills	<ol style="list-style-type: none"> <li>1. Benefits of networking skills</li> <li>2. Steps to build networking skills</li> </ol>	<ol style="list-style-type: none"> <li>1. Activity on networking</li> <li>2. Assignment on networking skills</li> </ol>	03
6. Describe the meaning and importance of self-motivation	<ol style="list-style-type: none"> <li>1. Meaning of self-motivation</li> <li>2. Types of motivation</li> <li>3. Steps to building self-motivation</li> </ol>	<ol style="list-style-type: none"> <li>1. Activity on staying motivated</li> <li>2. Assignment on reasons hindering motivation</li> </ol>	03
7. Set goals	<ol style="list-style-type: none"> <li>1. Meaning of goals purpose of goal-setting</li> <li>2. Setting SMART goals</li> </ol>	<ol style="list-style-type: none"> <li>1. Assignment on setting SMART goals</li> <li>2. Activity on developing long-term and short-term goals</li> </ol>	03
8. Apply time management strategies and techniques	<ol style="list-style-type: none"> <li>1. Meaning and importance of time management</li> <li>2. Steps for effective time management</li> </ol>	<ol style="list-style-type: none"> <li>1. Checklist for making preparation for daily activities</li> <li>2. Preparing To-do-list</li> </ol>	03
<b>Total</b>			<b>25</b>

### UNIT 3: INFORMATION AND COMMUNICATION TECHNOLOGY-III

Learning Outcome	Theory (08hrs)	Practical (12hrs)	Duration (20hrs)
1. Create a document on the word processor	<ol style="list-style-type: none"> <li>1. Introduction to ICT</li> <li>2. Advantages of using a word processor.</li> <li>3. Work with Libre Office Writer</li> </ol>	<ol style="list-style-type: none"> <li>1. Demonstration and practice of the following: <ul style="list-style-type: none"> <li>• Creating a new document</li> <li>• Typing text</li> </ul> </li> </ol>	02

		<ul style="list-style-type: none"> <li>• Saving the text</li> <li>• Opening and saving file on Microsoft word/Libre Office Writer.</li> </ul>	
2. Identify icons on the toolbar	<ol style="list-style-type: none"> <li>1. Status bar</li> <li>2. Menu bar</li> <li>3. Icons on the Menu bar</li> <li>4. Multiple ways to perform a function</li> </ol>	<ol style="list-style-type: none"> <li>1. Work with a basic user interface of LibreOffice writer</li> <li>2. Working with LibreOffice Writer or Microsoft Word</li> </ol>	02
3. Save, close, open and print document	<ol style="list-style-type: none"> <li>1. Save a word document</li> <li>2. Close</li> <li>3. Open an existing document</li> <li>4. Print</li> </ol>	<ol style="list-style-type: none"> <li>1. Perform the functions for saving, closing and printing documents on LibreOffice Writer</li> <li>2. Perform the functions on Microsoft Word</li> </ol>	02
4. Format text in a word document	<ol style="list-style-type: none"> <li>1. Change style and size of text</li> <li>2. Align text</li> <li>3. Cut, Copy, Paste</li> <li>4. Find and replace</li> </ol>	<ol style="list-style-type: none"> <li>1. Perform the functions of formatting on LibreOffice Writer</li> <li>2. Perform the functions of formatting on Microsoft Word</li> </ol>	02
5. Check spelling and grammar in a word document	<ol style="list-style-type: none"> <li>1. Use of spell checker</li> <li>2. Autocorrect</li> </ol>	<ol style="list-style-type: none"> <li>1. Perform the functions of checking spellings on LibreOffice Writer</li> <li>2. Perform the functions of checking the spelling on Microsoft Word</li> </ol>	02
6. Insert lists, tables, pictures, and shapes in a word document	<ol style="list-style-type: none"> <li>1. Insert bullet list</li> <li>2. Number list</li> <li>3. Tables</li> <li>4. Pictures</li> <li>5. Shapes</li> </ol>	<ol style="list-style-type: none"> <li>1. Perform the functions on LibreOffice Writer</li> </ol>	03
7. Insert header, footer and page number in a word document	<ol style="list-style-type: none"> <li>1. Insert header</li> <li>2. Insert footer</li> <li>3. Insert page number</li> <li>4. Page count</li> </ol>	<ol style="list-style-type: none"> <li>1. Perform the functions on LibreOffice Writer</li> <li>2. Perform the functions on Microsoft Word</li> </ol>	03
8. Make changes by using the track change option in a word document	<ol style="list-style-type: none"> <li>1. Tracking option</li> <li>2. Manage option</li> <li>3. Compare documents</li> </ol>	<ol style="list-style-type: none"> <li>1. Perform the functions on LibreOffice Writer</li> <li>2. Perform the functions on Microsoft Word</li> </ol>	04
<b>Total</b>			<b>20</b>

**UNIT 4: ENTREPRENEURIAL SKILLS – III**

<b>Learning Outcome</b>	<b>Theory (10hrs)</b>	<b>Practical (15hrs)</b>	<b>Duration (25hrs)</b>
1. Differentiate between different kinds of businesses	1. Introduction to entrepreneurship 2. Types of business activities	1. Role-play on different kinds of businesses	03
2. Describe the significance of entrepreneurial values	1. Meaning of value 2. Values of an Entrepreneur 3. Case study on qualities of an entrepreneur	1. Role-play on qualities of an entrepreneur	03
3. Demonstrate the attitudinal changes required to become an entrepreneur	1. Difference between the attitude of entrepreneur and employee	1. Interviewing employees and entrepreneurs	03
4. Develop thinking skills like an entrepreneur	1. Problems of entrepreneurs 2. Problem-solving 3. Ways to think like an entrepreneur	1. Group activity on identifying and solving problems	04
5. Generate business ideas	1. The business cycle 2. Principles of idea creation 3. Generating a business idea 4. Case studies	1. Group activity to create business ideas	04
6. Describe customer needs and the importance of conducting a customer survey	1. Understanding customer needs 2. Conducting a customer survey	1. Conducting a customer survey	04
7. Create a business plan	1. Importance of business planning 2. Preparing a business plan 3. Principles to follow for growing a business 4. Case studies	1. Activity on developing a business plan	04
<b>Total</b>			<b>25</b>

<b>UNIT 5: GREEN SKILLS – III</b>			
<b>Learning Outcome</b>	<b>Theory (07 hrs)</b>	<b>Practical (08 hrs)</b>	<b>Duration (15 hrs)</b>
1. Describe the importance of the main sector of the green economy	1. Meaning of ecosystem, food chain and sustainable development 2. Main sectors of the green economy- E-waste management, green transportation, renewal energy, green construction, and water management	1. Discussion on sectors of green economy 2. Preparing posters on various sectors for promoting green economy 3. Writing an essay or a short note on the important initiatives for promoting green economy.	06
2. Describe the main recommendations of policies for the green economy	1. Policies for a green economy	1. Discussion on initiatives for promoting the green economy	03
3. Describe the major green sectors/ areas and the role of various stakeholders in the green economy	1. Stakeholders in the green economy	1. Group discussion on the role of stakeholders in the green economy 2. Preparation of posters on green sectors and their stakeholders 3. Making solar bulbs.	03
4. Identify the role of government and private agencies in the green economy	1. Role of the government in promoting a green economy 2. Role of private agencies in promoting green economy	1. Discussion on the role of Government and Private Agencies in promoting a green economy. 2. Posters on green sectors.	03
<b>Total</b>			<b>15</b>

### Part B–Vocational Skills – Grade 11

<b>S.No.</b>	<b>Units</b>	<b>Duration (Hrs.)</b>
1.	Unit 1: Introduction to Food Processing	14
2.	Unit 2: Dairy Processing	48
3.	Unit 3: Elements of Ice Cream Processing	43
4.	Unit 4: Basics of Ice Cream Production	40
5.	Unit 5: Food Safety and Hygiene	20
	<b>Total</b>	<b>165</b>

<b>Unit 1: Introduction to Food Processing</b>			
<b>Learning Outcome</b>	<b>Theory (07 Hrs)</b>	<b>Practical (07 Hrs)</b>	<b>Duration (14 Hrs)</b>
1. Explain food processing and its types.	<ol style="list-style-type: none"> <li>1. Overview of Food processing</li> <li>2. Types of food processing               <ol style="list-style-type: none"> <li>(i) Primary processing</li> <li>(ii) Secondary processing</li> <li>(iii) Tertiary Processing</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>1. Draw infographics on the journey of food from farmer to consumer.</li> <li>2. Classify the food products according to the type of processing (primary, secondary tertiary)</li> </ol>	<b>4</b>
2. Describe the current scenario and significance of the Indian food processing industry.	<ol style="list-style-type: none"> <li>1. Indian food processing Industry               <ol style="list-style-type: none"> <li>(i) Present scenario</li> <li>(ii) Scope of the Indian food processing industry</li> </ol> </li> <li>2. Challenges and opportunities in the food processing industry in India</li> </ol>	<ol style="list-style-type: none"> <li>1. Prepare a report on the contribution of the food processing sector to the Indian economy.</li> <li>2. Make a chart on various revolutions of the Indian food processing industry.</li> <li>3. Brainstorming on innovation and changing face of the food processing industry across the world.</li> <li>4. Prepare a chart pertaining to SWOT analysis of the food processing industry of India.</li> </ol>	<b>4</b>
1. Describe the various sub sectors of food processing.	<ol style="list-style-type: none"> <li>1. Sub sectors of food processing               <ol style="list-style-type: none"> <li>(i) Dairy</li> <li>(ii) Cereals and grains</li> <li>(iii) Fruits and vegetable</li> <li>(iv) Bakery</li> <li>(v) Meat, poultry and fisheries</li> <li>(vi) Beverages</li> <li>(vii) Food packaging</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>1. Observe your home kitchen and prepare a chart on the following aspects:               <ol style="list-style-type: none"> <li>(i) Category food products available in your house (sectors wise)</li> <li>(ii) Identify the food sector with major and least spending at your home.</li> <li>(iii) Collect packaging material used for different food products (bakery, milk, fruits, frozen vegetables etc.).</li> </ol> </li> </ol>	<b>06</b>

## Unit 2: Dairy Processing

Learning Outcome	Theory (23 Hrs.)	Practical (25 Hrs.)	Duration (48 Hrs.)
1. Describe the dairy industry in India	<ol style="list-style-type: none"> <li>1. Overview of dairy processing industry in India</li> <li>2. Ice cream processing industry</li> <li>3. Origin of Ice Creams</li> </ol>	<ol style="list-style-type: none"> <li>1. Make a project covering following aspects of milk processing:               <ol style="list-style-type: none"> <li>(i) Major milk-producing states in India</li> <li>(ii) Manpower engaged in the dairy sector</li> <li>(iii) Contribution of the dairy sector to Indian GDP</li> <li>(iv) Share of major milk products in dairy sector</li> <li>(v) Type of packaging used for various dairy products</li> <li>(vi) Major market players in dairy industry</li> </ol> </li> </ol>	<b>05</b>
2. Describe the categories of milk and its products.	<ol style="list-style-type: none"> <li>1. Milk and milk products               <ol style="list-style-type: none"> <li>(i) Composition of milk</li> <li>(ii) Types of milk (full cream, toned, double toned, skimmed etc.)</li> <li>(iii) Categories of milk products (paneer, curd, butter, ice cream, khoa, ghee)</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>1. Prepare a pictorial chart depicting various categories of milk and milk products available in the market.</li> <li>2. Storage and marketing of different dairy products</li> </ol>	<b>15</b>
3. Describe the units of dairy processing plant.	<ol style="list-style-type: none"> <li>1. Units of a dairy processing plant               <ol style="list-style-type: none"> <li>(iv) Milk reception area</li> <li>(v) Processing sections (Pasteurizer, homogenizer, separators etc.)</li> <li>(vi) Powder sections</li> <li>(vii) Ice cream sections (blenders, pasteurizer, homogenizer)</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>1. Visit to a milk processing unit/ plant to understand:               <ol style="list-style-type: none"> <li>(i) Different sections of the plant</li> <li>(ii) Equipment</li> <li>(iii) Draw a process flow diagram of milk processing section and different milk products</li> </ol> </li> </ol>	<b>20</b>

	<ul style="list-style-type: none"> <li>(viii) Freezing/ cooling Sections</li> <li>(ix) Storage and packaging</li> </ul> <p>2. Equipment used in dairy processing industry</p> <ul style="list-style-type: none"> <li>(i) Milk silos/ storage tanks</li> <li>(ii) Pasteurizer (plate heat exchanger, scraped surface heat exchanger)</li> <li>(iii) Homogenizer</li> <li>(iv) Milk chiller</li> <li>(v) Freezer</li> <li>(vi) Spray dryer</li> <li>(vii) Packaging equipment</li> </ul>	3. Video on different unit operations employed in milk and ice cream processing.	
4. Perform cleaning and maintenance of work area	<p>1. Cleaning of the work area</p> <ul style="list-style-type: none"> <li>(i) Cleaning material/ agents</li> <li>(ii) Cleaning equipment and tool</li> </ul> <p>2. Methods of cleaning</p> <ul style="list-style-type: none"> <li>(i) Cleaning-in-place (CIP)</li> <li>(ii) Cleaning-out-of-place (COP)</li> <li>(iii) Sterilising-in-place (SIP)</li> </ul> <p>3. Maintenance and their types</p> <ul style="list-style-type: none"> <li>(i) Preventive</li> <li>(ii) Predictive</li> <li>(iii) Corrective and</li> <li>(iv) Scheduled</li> </ul> <p>4. Precautionary measures during cleaning and sanitization</p> <p>5. Disposal of waste</p>	<p>1. Prepare pictorial chart depicting sanitation practices for work area.</p> <p>2. List out the cleaning agents used for working area and equipment.</p> <p>3. Enlist the criteria for selecting a cleaning agent to be used for cleaning of different milk processing sections.</p>	<b>08</b>
<b>Total</b>			<b>48</b>

### Unit 3: Elements of Ice Cream Processing

Learning Outcome	Theory (19 Hrs.)	Practical (24 Hrs.)	Duration (30 Hrs.)
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1. Describe the jobs and responsibilities of Ice cream Processing Technician	1. Ice Cream Processing Technician (i) Job description (ii) Responsibilities of "Ice Cream Processing Technician"	1. Demonstrate the duties of "Ice Cream Processing Technician"	<b>04</b>
2. Explain the raw material requirement for ice cream production.	1. Raw material used for ice cream production (i) Milk <ul style="list-style-type: none"> <li>• Composition of milk</li> <li>• Nutritive value of milk</li> <li>• Milk testing (Fat, Solid not fat)</li> </ul> (ii) Sugar and sweeteners <ul style="list-style-type: none"> <li>• Stabilizers</li> <li>• Emulsifiers</li> <li>• Flavours</li> <li>• Colors</li> </ul>	1. Prepare a list on types of milk available in the market and discuss in class why they are different from each other. 2. Perform boiling and pasteurization of milk. 3. Prepare a list of different types of ingredients mentioned on the ingredients list of the ice cream.	<b>15</b>
3 Schedule preparation required before starting production	5. Identification of production requirement (i) Process chart (ii) Product flow chart (iii) Recipe/procedural needs 6. Essential elements of production (with respect to processing time, production order and batch size) (i) Human resources (ii) Raw material (iii) Machinery/equipment	1. Make a project on scheduling a production of any milk based processed products covering following aspects: (i) Manpower required (ii) Assigning duties (iii) Estimate raw materials required along with quantity (iv) Supplier of the raw material (v) Time of pre-preparation (vi) Time for production (vii) Equipment and utensils required (viii) Batch size, quantity (ix) Packaging material required	<b>10</b>
1. Elaborate on food safety hygiene standards to follow in a milk processing equipment	1. Food safety and hygiene standards for work area 2. Schedule 4 of FSSAI	1. Prepare pictorial chart depicting food safety hygiene practices for work area.	<b>10</b>

1. 2. Prepare work area and process equipment/ machinery for production	1. Preparing the work area before starting production 2. Prepare the machines and tools required for production.	1. Rearrange the ingredients and equipment as per the formulation of the ice cream.	<b>4</b>
<b>Total</b>			<b>43</b>

### Unit 4: Basics of Ice Cream Production

Learning Outcome	Theory (18 Hrs.)	Practical (22 Hrs.)	Duration (40 Hrs.)
1. Explain production of ice cream.	1. Ice cream (i) Composition of ice cream materials (ii) Types of ice cream (iv) Process of producing ice cream	1. Survey the market and prepare a report on major ice-cream producing brands, types of ice creams manufactured and innovative types of ice-cream.  2. Prepare a chart on process of preparing ice cream.	<b>15</b>
1. Explain unit operation involved in ice cream production	1. Unit operations of Ice Cream Production: (i) Blending (ii) Pasteurization (iii) Homogenization (iv) Separation and bactofugation (v) Ageing (vi) Standardisation of milk (vii) Freezing (rapid cooling techniques) (viii) Over run (ix) Packaging (x) Storage	1. Demonstrate step-by-step process of: (i) Blending (ii) Pasteurization (iii) Homogenization (iv) Separation and bactofugation (v) Ageing (vi) Standardisation of milk (vii) Freezing (viii) Packaging (ix) Storage  2. Video on different processes employed in Ice Cream Processing	<b>15</b>
1. Perform the various process of producing different types of ice cream	1. Production of ice cream and syrup (i) Production for plain ice cream (ii) Production of frozen desserts (iii) Production of premium ice	1. Demonstrate the process of producing plain ice cream 2. Demonstrate the process of producing frozen desserts 3. Demonstrate the process of producing premium	<b>10</b>

	cream (iv) Production of syrup	ice cream 4. Demonstrate the process of producing <i>kulfi</i>	
<b>Total</b>			<b>40</b>

## Unit 5: Food Safety and Hygiene

Learning Outcome	Theory (07 Hrs)	Practical (13 Hrs)	Duration (20 Hrs)
<ol style="list-style-type: none"> <li>Explain the ways to ensure food safety and factors affecting food safety, shelf life.</li> <li>Describe food safety hazards and associated risks.</li> </ol>	<ol style="list-style-type: none"> <li>Food safety</li> <li>Shelf life of food</li> <li>Factors affecting food safety and shelf life of food</li> <li>Food safety hazards</li> <li>Quality testing of milk (Microbial, pH, TSS, adulteration with starch/detergent, Methyl blue reduction test, etc.)</li> </ol>	<ol style="list-style-type: none"> <li>Identify and categorize food safety hazards in your food laboratory and surrounding. Suggest the measures for removal of these hazards.</li> <li>Take a sample of milk and milk products and check them for adulteration and TSS.</li> </ol>	06
<ol style="list-style-type: none"> <li>Elaborate on Food Safety Management Systems (FSMS)</li> </ol>	<ol style="list-style-type: none"> <li>Food safety practices               <ol style="list-style-type: none"> <li>GMP</li> <li>GHP</li> <li>HACCP</li> <li>Other measures</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>Visit a nearby food/milk processing unit and observe the following:               <ol style="list-style-type: none"> <li>The area where food/milk products are prepared and served</li> <li>How is the product prepared and stored?</li> <li>How is the food/milk product served and marketed?</li> <li>Comment if the outlet is following in some ways the approaches of HACCP, GMP and</li> </ol> </li> </ol>	06

		<p>GHP or not.</p> <p>b. Identify the critical control points in the outlet and give suggestions for improvement in this area.</p> <p>c. Identify the storage conditions of milk and milk products.</p>	
1. Explain food safety laws implemented in India.	<p>1. Food safety laws in India .</p> <p>a. Prevention of Food Adulteration Act</p> <p>b. Fruit and Vegetable Product Order</p> <p>c. Vegetable Oil Products Order</p> <p>d. Milk and Milk Products Order</p> <p>e. Agricultural grading and Marketing (AGMARK) (1937)</p> <p>f. Food Safety and Standards Authority of India</p>	<p>1. Collect the empty packets of food products. Observe, identify and note down if any symbol related to food safety laws is printed on packaging.</p> <p>2. Find out the meaning of the symbol printed on packaging of the product.</p> <p>3. Visit the FSSAI website <a href="https://fssai.gov.in/index.php?page=standards.php">https://fssai.gov.in/index.php?page=standards.php</a></p>	<b>03</b>
1. Describe the importance of personal hygiene and sanitation in ice cream processing unit.	<p>1. Personal hygiene and sanitation guidelines</p> <p>2. Aspects of maintaining hygienic work place:</p> <p>(i) Building and layout of the unit</p> <p>(ii) Equipment</p> <p>(iii) Waste disposal</p> <p>(iv) Pest</p> <p>(v) control</p>	<p>1. Demonstration of how to wear uniform including chef coat, apron, gloves, hair caps, socks, shoes etc.</p> <p>2. Hand washing technique</p> <p>3. Video on food safety practices</p>	<b>05</b>
<b>Total</b>			<b>20</b>

## CLASS 12

### Part A: Employability Skills

S.No.	Units	Duration (hrs)
1.	Communication Skills- IV	25
2.	Self-management Skills – IV	25
3.	Information and Communication Technology Skills - IV	20
4.	Entrepreneurial Skills – IV	25
5.	Green Skills – IV	15
	<b>Total</b>	<b>110</b>

<b>UNIT 1: COMMUNICATION SKILLS – IV</b>			
<b>Learning Outcome</b>	<b>Theory (10hrs)</b>	<b>Practical (15hrs)</b>	<b>Duration (25hrs)</b>
1. Demonstrate active listening skills	1. Active listening - listening skill, stages of active listening 2. Overcoming barriers to active listening	1. Demonstration of the factors affecting active listening 2. Preparing posters of steps for active listening 3. Role-play on negative effects of not listening actively	10
2. Identify the parts of speech	1. Parts of speech – using capitals, punctuation, basic parts of speech, supporting parts of speech	1. Group practice on identifying parts of speech 2. Group practice on constructing sentences	10
3. Write sentences	1. Writing skills to the following: <ul style="list-style-type: none"> <li>• Simple sentence</li> <li>• Complex sentence</li> <li>• Types of object</li> </ul> 2. Types of sentences <ul style="list-style-type: none"> <li>- Active and Passive sentences</li> <li>- Statement/Declarative sentence</li> <li>- Question/Interrogative sentence</li> </ul>	1. Group work on writing sentences and paragraphs 2. Practice writing sentences in the active or passive voice 3. Writing different types of sentences	5

	<ul style="list-style-type: none"> <li>- Emotion/Reaction or Exclamatory sentence</li> <li>- Order or Imperative sentence</li> </ul> <p>3. Paragraph writing</p>		
<b>Total</b>			<b>25</b>
<b>UNIT 2: SELF-MANAGEMENT SKILLS – IV</b>			
<b>Learning Outcome</b>	<b>Theory (10hrs)</b>	<b>Practical (15hrs)</b>	<b>Duration (25hrs)</b>
1. Describe the various factors influencing motivation and positive attitude	<ol style="list-style-type: none"> <li>1. Motivation and positive attitude</li> <li>2. Intrinsic and extrinsic motivation</li> <li>3. Positive attitude – ways to maintain positive attitude</li> <li>4. Stress and stress management - ways to manage stress</li> </ol>	<ol style="list-style-type: none"> <li>1. Role-play on avoiding stressful situations</li> <li>2. Activity on self-reflection</li> </ol>	10
2. Describe how to become result oriented	<ol style="list-style-type: none"> <li>1. How to become result oriented?</li> <li>2. Goal setting – examples of result-oriented goals</li> </ol>	<ol style="list-style-type: none"> <li>1. Pair and share activities on the aim of life</li> </ol>	5
3. Describe the importance of self-awareness and the basic personality traits, types and disorders	<ol style="list-style-type: none"> <li>1. Steps towards self-awareness</li> <li>2. Personality and basic personality traits</li> <li>3. Common personality disorders- <ul style="list-style-type: none"> <li>• Suspicious</li> <li>• Emotional and impulsive</li> <li>• Anxious</li> </ul> </li> <li>4. Steps to overcome personality disorders</li> </ol>	<ol style="list-style-type: none"> <li>1. Group discussion on self-awareness</li> </ol>	10
<b>Total</b>			<b>25</b>

<b>UNIT3: INFORMATION AND COMMUNICATION TECHNOLOGY SKILLS-IV</b>			
<b>Learning Outcome</b>	<b>Theory (06hrs)</b>	<b>Practical (14hrs)</b>	<b>Duration (20hrs)</b>

1. Identify the components of a spreadsheet application	1. Introduction to spreadsheet application - types of a spreadsheet, creating a new worksheet, components of a worksheet.	1. Group practice on working with LibreOffice	02
2. Perform basic operations in a spreadsheet	1. Opening workbook and entering data – types of data, steps to enter data, editing and deleting data in a cell 2. Selecting multiple cells 3. Saving the spreadsheet in various formats 4. Closing the spreadsheet 5. Opening the spreadsheet. 6. Printing the spreadsheet.	1. Group practice on working with data on LibreOffice Calc.	03
3. Demonstrate the knowledge of working with data and formatting text	1. Using a spreadsheet for addition – adding value directly, adding by using cell address, using a mouse to select values in a formula, using sum function, copying and moving formula 2. Need to format cell and content 3. Changing text style and font size 4. Align text in a cell 5. Highlight text	1. Demonstration of basic calculations in LibreOffice Calc. 2. Group practice on formatting a spreadsheet in LibreOffice Calc.	02
4. Demonstrate the knowledge of using advanced features in spreadsheet	1. Sorting data 2. Filtering data 3. Protecting spreadsheet with password	1. Group practice on sorting data in LibreOffice Calc	03
5. Make use of the software used for making slide presentations	1. Available software presentation 2. Steps to start LibreOffice Impress 3. Adding text to a presentation	1. Group practice on working with LibreOffice Impress tools 2. Group practice on creating a presentation in LibreOffice Impress	02
6. Open, close and save slide presentations	1. Open, Close, Save and Print a slide presentation	1. Practice exercises on steps to save, close, open and save a	01

		presentation	
7. Demonstrate the operations related to slides and texts in the presentation	1. Working with slides and text in a presentation- adding slides to a presentation, deleting slides, adding and formatting text, highlighting text, aligning text, changing text colour	1. Group practice on working with font styles and types in LibreOffice Impress	04
8. Demonstrate the use of advanced features in a presentation	1. Advanced features used in a presentation 2. Inserting shapes in the presentation 3. Inserting clipart and images in a presentation 4. Changing slide layout	1. Group practice on working with slides in LibreOffice Impress	03
<b>Total</b>			<b>20</b>

**UNIT 4: ENTREPRENEURIAL SKILLS-IV**

<b>Learning Outcome</b>	<b>Theory (10hrs)</b>	<b>Practical (15hrs)</b>	<b>Duration (25hrs)</b>
1. Describe the concept of entrepreneurship and the types and roles and functions entrepreneur	1. Entrepreneurship and entrepreneur 2. Characteristics of entrepreneurship 3. Entrepreneurship-art and science 4. Qualities of a successful entrepreneur 5. Types of entrepreneurs 6. Roles and functions of an entrepreneur 7. What motivates an entrepreneur 8. Identifying opportunities and risk-taking 9. Startups	1. Group discussion on the topic "An entrepreneur is not born but created". 2. Quiz on various aspects of entrepreneurship.	10
2. Identify the barriers to entrepreneurship	1. Barriers to entrepreneurship 2. Environmental barriers 3. No or faulty business plan 4. Personal barriers	1. Fishbowl of fears- group discussion about what we fear about entrepreneurship 2. Facing an Interview.	05
3. Demonstrate the knowledge of entrepreneurial attitude and competencies	1. Entrepreneurial attitude 2. Entrepreneurial competencies 3. Decisiveness, 4. Initiative 5. Interpersonal skills-	1. Group discussion on business ideas 2. Group practice on best out of waste 3. Group discussion on the topic of lets	10



	positive attitude, stress management 6. Perseverance 7. Organisational skills- time management, goal setting, efficiency, managing quality.	grow together 4. Group practice on a snowball fight. 5. Activity on rating friends and self for entrepreneurial qualities. 6. Playing games, such as "Who am I".	
<b>Total</b>			<b>25</b>

<b>UNIT 5: GREEN SKILLS-IV</b>			
<b>Learning Outcome</b>	<b>Theory (05hrs)</b>	<b>Practical (10hrs)</b>	<b>Duration (15hrs)</b>
1. Identify the benefits of the green jobs	1. Green jobs 2. Benefits of green jobs 3. Green jobs in different sectors: <ul style="list-style-type: none"> <li>• Agriculture</li> <li>• Transportation</li> <li>• Water conservation</li> <li>• Solar and wind energy</li> <li>• Eco-tourism</li> <li>• Building and construction</li> <li>• Solid waste management</li> <li>• Appropriate technology</li> </ul>	1. Group discussion on the importance of green job.	8
2. State the importance of green jobs	1. Importance of green jobs in <ul style="list-style-type: none"> <li>• Limiting greenhouse gas emissions</li> <li>• Minimizing waste and pollution</li> <li>• Protecting and restoring ecosystems</li> <li>• Adapting to the effects of climate change</li> </ul>	1. Preparing posters on green jobs. 2. Activities on tree plantation.	7
<b>Total</b>			<b>15</b>

## Part B–Vocational Skills- Class 12

S.No.	Units	Duration(Hrs)
1.	Unit 1: Overview of Ice Cream Industry	25
2.	Unit 2: Ice Creams and Frozen Desserts	60
3.	Unit 3: Production of Ice Creams	45
4.	Unit 4: Food Preservation	15
5.	Unit 5: Marketing of Ice Creams and Frozen Desserts	20
	<b>Total</b>	<b>165</b>

<b>Unit 1: Overview of Ice Cream Industry</b>			
<b>Learning Outcome</b>	<b>Theory (11 Hrs)</b>	<b>Practical (14 Hrs)</b>	<b>Duration (25 Hrs)</b>
1. Describe history, development and status of ice cream industry.	1. Ice Creams: Introduction 2. Origin of ice creams 3. Frozen desserts 4. History and advancement in ice creams and frozen desserts	1. Make a chart on journey of the ice cream from origin to new innovation in ice cream.	<b>10</b>
2. Explain growth and market trends in the ice cream industry.	1. Development in ice cream and frozen desserts 1. Growth and market trends in the ice cream industry	1. Prepare a list of ice cream manufacturing units in your city and type of products they are manufacturing. 2. Prepare a short report on recent advancement/innovations happening in ice cream industry and discuss in class that how these advancements /innovations will impact the market?	<b>5</b>

3. Enlist types of ice creams and frozen desserts consumed around the world.	1. Ice creams around the world (i) Argentine helado (ii) Italian gelato (iii) <i>Pagotó</i> (iv) <i>Kulfi</i> (v) <i>Fālūde</i> (vi) Dondurma	1. Prepare pictorial chart on popular ice creams of the world with their cultural significance. 2. Identify different types of ice cream consumed around the world.	10
<b>Total</b>			<b>25</b>

## Unit 2: Ice Creams and Frozen Desserts

Learning Outcome	Theory (28 Hrs)	Practical (32 Hrs)	Duration (60 Hrs)
1. Describe ice creams, its composition and role of Ingredients in Ice cream production.	1. Definition of ice cream 2. Role of ingredients in Ice cream production (i) Dairy ingredients (ii) Stabilizers (iii) Emulsifiers (iv) Sweetening agents (v) Flavouring agents (vi) Coloring agents (vii) Other ingredients 3. Critical Control Point (CCP) in ice cream Formulation (i) Percentage, ratio of all the ingredients (ii) Temperature of ingredients and (iii) Ambient environment	1. Prepare a list on types of ice cream and frozen desserts available in your locality. 2. Find packaging of any five types of ice cream. Read their label and prepare a note on the followings: (i) Ingredients (ii) Type of stabilizer (iii) Type of emulsifier (iv) Type of flavouring agent (v) Type of sweetening (vi) Any other relevant information	20
2. Classify ice creams on the basis of ingredients used and consistency.	2. Classification of ice cream-I (i) Plain (ii) Fruit and nuts (iii) Chocolate (iv) Ice lollies (v) Candies (vi) <i>Kulfi</i>	1. Choose one of your favorite ice cream or frozen desserts out of the list which you have prepared and discuss in class why it is your favorite.	

	<p>2. Classification of ice cream –II</p> <ul style="list-style-type: none"> <li>(i) Sherbets and ices,</li> <li>(ii) Mousses</li> <li>(iii) Gelato</li> <li>(iv) Bisque</li> <li>(v) Custards</li> <li>(vi) Cassatta</li> <li>(vii) Variegated ice cream</li> <li>(viii) Novelties</li> </ul>	<p>1. Visit any food ice cream manufacturing unit.</p> <p>2. List types of ice creams and frozen desserts being prepared there.</p> <p>3. Identify and enlist the type of machines/equipment being used there.</p>	<b>10</b>
<b>Total</b>			<b>25</b>

### Unit 3: Production of Ice Creams

Learning Outcome	Theory (13 Hrs)	Practical (32 Hrs)	Duration (45 Hrs)
1. Prepare different types of ice creams	<p>1. Preparation of ice cream-I</p> <ul style="list-style-type: none"> <li>(i) Plain</li> <li>(ii) Fruit and nuts</li> <li>(iii) Chocolate</li> <li>(iv) Ice lollies</li> <li>(v) Candies</li> <li>(vi) Kulfi</li> </ul> <p>2. Preparation of ice cream –II</p> <ul style="list-style-type: none"> <li>(i) Sherbets and ices,</li> <li>(ii) Mousses</li> <li>(iii) Gelato</li> <li>(iv) Bisque</li> <li>(v) Custards</li> <li>(vi) Cassatta</li> <li>(vii) Variegated ice cream</li> </ul>	1. Formulate one ice cream of your choice and preferable flavor using your creativity and innovation.	<b>20</b>
2. Describe the quality parameters for freshly prepared ice creams.	<p>Quality parameters for freshly prepared ice creams:</p> <ul style="list-style-type: none"> <li>(i) Fat estimation</li> <li>(ii) Titrable acidity</li> <li>(iii) Protein</li> <li>(iv) Total Solids</li> <li>(v) pH</li> <li>(vi) Brix</li> <li>(vii) Texture</li> <li>(viii) Sensory</li> <li>(ix) Melting</li> </ul>	<p>Perform following experiments in your laboratory:</p> <ul style="list-style-type: none"> <li>(i) Fat estimation</li> <li>(ii) Titrable acidity</li> <li>(iii) Protein</li> <li>(iv) Total Solids</li> <li>(v) pH</li> <li>(vi) Brix</li> <li>(vii) Texture</li> <li>(viii) Sensory</li> <li>(ix) Melting</li> </ul>	<b>10</b>

3. Explain packaging of ice cream and frozen desserts.	1. Packaging of ice cream (i) Criteria for selection of packaging material (ii) Packaging equipment (iii) Defects and faults in packaging of ice creams	1. Identification of different types of packaging materials used in ice cream packaging.  2. Design a logo and label for your ice cream and discuss the strategies to increase the sale of your products in your class.	<b>15</b>
<b>Total</b>			<b>45</b>

#### Unit 4: Food Preservation

Learning Outcome	Theory (07 Hrs)	Practical (08 Hrs)	Duration (15 Hrs)
1. Describe the food spoilage, causes of food spoilage and changes in food quality due to food spoilage.	1. Food spoilage  2. Causes of food spoilage (i) Microbial (ii) Enzymatic (iii) Chemical (iv) Physical factors  3. Changes in food quality due to spoilage	1. Store milk, paneer and cheese at room temperature for five days. (i) Observe changes occurring in these products and report your findings. (ii) Discuss out of these three products, which one spoiled faster and why?	<b>5</b>
2. Explain factors affecting food spoilage.	1. Factors affecting food spoilage (i) Moisture content (ii) Temperature (iii) Oxygen (iv) Acidity (v) Nutrient composition of food (vi) Storage conditions	1. Store few perishable food items for few days at different freezing, chilling and room temperature and note down the changes occurring.	<b>5</b>
1. Describe food preservation and techniques of preserving food.	1. Food preservations 2. Principles of food preservation 3. Techniques of food preservation (i) Traditional techniques (ii) Modern techniques	1. Measuring of temperature inside the chilling and freezing facility 2. Measuring of temperature during pasteurization	<b>5</b>
<b>Total</b>			<b>15</b>

<b>Unit 5: Marketing of Ice creams and Frozen Desserts</b>			
<b>Learning Outcome</b>	<b>Theory (08)</b>	<b>Practical (12)</b>	<b>Duration (20)</b>
1. Describe the marketing Ice creams and Frozen Desserts.	<ol style="list-style-type: none"> <li>1. Concept of Marketing</li> <li>2. Difference between Marketing and Sales</li> <li>3. Branding</li> <li>4. Marketing strategies               <ol style="list-style-type: none"> <li>(i) Packaging</li> <li>(ii) Shelf life</li> <li>(iii) Social and print media</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>1. Make an imaginary product profile and sell it in your school</li> <li>2. While the students go for OJT in industries, select a product and promote it on social media and submit a report</li> </ol>	<b>10</b>
2. Describe the importance of entrepreneurship incubation centers and start-ups.	<ol style="list-style-type: none"> <li>1. Incubation Centre</li> <li>2. Start-ups</li> <li>3. Feasibility analysis of the project</li> <li>4. Preparation of Project Profile</li> <li>5. Registration and Licensing</li> <li>6. Funding Agencies involved in promoting entrepreneurship and start-ups               <ol style="list-style-type: none"> <li>(i) Micro, Small &amp; Medium Enterprises (MSME)</li> <li>(ii) Ministry of Food Processing Industries (MoFPI)</li> <li>(iii) National Bank for Agriculture and Rural Development (NABARD)</li> <li>(iv) National Rural Livelihood Mission (NRLM)</li> <li>(v) Khadi and Village Industries</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>1. Identify the industries preferably in Ice creams and Frozen Desserts products in your district.</li> <li>2. Prepare a project profile of the industry in the district.</li> <li>3. Visit an incubation Centre.</li> </ol>	<b>10</b>

	Commission (KVIC) (vi) Banks		
<b>Total</b>			<b>20</b>

## 6. ORGANISATION OF FIELD VISITS

In a year, at least 5 visits to a nearby ice cream processing units/ milk processing units should be organised for the students to expose them to the various routine activities undertaken at a milk processing unit/ industry.

Visits to a nearby ice cream processing industry/unit should facilitate the students to observe for themselves the following:

Location, milk collection area and storage area, weighing room, processing sections, storage chamber, production area, packing chamber, supply counter or room, cleaning and maintenance area, waste disposal area, etc. During the visit, students observe and obtain the following information from the owner or the supervisor of the processing unit/industry:

1. Approaches to manage of dairy processing unit.
2. Identification of categories of ice cream and frozen desserts.
3. Identification of various types of ice cream processing equipment, machinery, tools and utensils used in industry.
4. Maintenance procedure of the production machines and their component.
5. Procedures followed for preparing the raw material to be used for production.
6. Standard practices to be followed for food production.
7. Understand roles and responsibilities of a Ice cream Processing Technician.
8. Ways to ensure and implement food safety and personal hygiene at the workplace.
9. Types of packaging material used
10. Types of products prepared
11. Hygiene and safety practices used
12. Quality parameters used for testing of the finished products
13. Total input and output handled annually
14. Manpower engaged
15. Total annual income
16. Profit/Loss (Annual)
17. Any other information

## 7. LIST OF EQUIPMENT AND MATERIALS

The list given below is suggestive and an exhaustive list should be prepared by the vocational teacher. Only basic tools, equipment and accessories should be procured by the schools so that the routine tasks can be performed by the students regularly for practice and acquiring adequate practical experience.

S. No.	Particulars	Quantity	Approximate cost (Rupees)
1.	Ice Cream Maker	1	100000/-
2.	Freezers	1	50000/-
3.	Pasteurizer	1	100000/-
4.	Homogenizer	1	150000/-
5.	Bulk milk Cooler	1	125000/-
6.	Refrigerator	1	25000/-
7.	Milk storage tanks (50 liter)	2	14000/-
8.	Cream separator	1	25000/-
9.	Milk Filter machine	1	12000/-
10.	Ice Bar Packaging machine	1	200000/-
11.	Chiller	1	30000/-
12.	Miscellaneous	-	20000/-
13.	Weighing balance	1	5000/-
14.	Milk collection and handling accessories	1	20000
15.	Milk strainer	1	1000
16.	Lactometer	1	2500
	<b>Total</b>		<b>8,79,500/-</b>



## 8. VOCATIONAL TEACHER'S/ TRAINER'S QUALIFICATION AND GUIDELINES

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**Q**ualification and other requirements for appointment of vocational teachers/trainers on contractual basis should be decided by the State/UT. The suggestive qualifications and minimum competencies for the vocational teacher should be as follows:

S.No.	Qualification	Minimum Competencies	Age Limit
1.	Post-Graduation in dairy technology/ dairy sciences/food processing/ food technology/food science/ nutrition/ agriculture engineering/ from a recognized Institute /University, with at least 1 year work experience in industry.	<ul style="list-style-type: none"> <li>• Effective communication skills (oral and written)</li> <li>• Basic computing Skills</li> </ul>	18-37 years (as on Jan. 01 (year)) Age relaxation to be provided as per Govt. rules

## 9. LIST OF CONTRIBUTORS

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### Course Coordinator

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## 10. LIST of REVIEWERS:

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## **PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION**

(a constituent unit of NCERT, under Ministry of Education, Government of India)

**Shyamla Hills, Bhopal- 462 002, Madhya Pradesh, India**