

COMPETENCY BASED CURRICULUM

FOR THE TRADE OF

MILK AND MILK PRODUCTS

SEMESTER-I & II

UNDER

CRAFTSMAN TRAINING SCHEME (CTS)

IN SEMESTER PATTERN

BY



GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

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1. INTRODUCTION

India is one of the youngest nations in the world. Our youth are our strength. However, a challenge facing the country is that of skilling our youth as per the demands of the industry. Recognizing the need for quickly coordinating the skill development and entrepreneurship efforts of all concerned stakeholders, the Government of India created the Ministry of Skill Development and Entrepreneurship on 9th November, 2014. To create further convergence between the Vocational Training System through Industrial Training Institutes (ITIs) and the new skill initiatives of the Government, the Training and Apprenticeship Training divisions from the Directorate General of Employment and Training (DGET) under the Ministry of Labour and Employment stand transferred to the Ministry of Skill Development and Entrepreneurship (MSDE) with effect from 16th April, 2015. This move brings over 11000 ITIs and scores of other institutions, and the Apprenticeship and Training divisions, under the Ministry.

The Ministry of Skill Development and Entrepreneurship is an apex organization for the development and coordination of the vocational training including Women's Vocational Training in our country. The Ministry conducts the vocational training programmes through the Craftsmen Training Scheme (CTS), Apprenticeship Training Scheme (ATS), Modular Employable Scheme (MES) under the Skill Development Initiative (SDI) Scheme, and Craftsmen Instructor Training Scheme (CITS) to cater the needs of different segments of the Labour market. The National Council for Vocational Training (NCVT) acts as a central agency to advise Government of India in framing the training policy and coordinating vocational training throughout India. The day-to-day administration of the ITIs rests with the State Governments/ Union Territories.

- Training courses under the CTS is being offered through a network of more than 11000 Government and Private Industrial Training Institutes (ITIs) located all over the country with a total seating capacity of more than 16 Lakhs with an objective to provide skilled workforce to the industry in 126 trades. Skill development courses exclusively for women are also being offered under CTS and other schemes through Government and Private ITIs and Regional Vocational Training Institutes (RVITIs) for Women.
- The Apprentices Act, 1961 was enacted with the objective of regulating the program of apprenticeship training in the industry by utilizing the facilities available within for imparting on-the-job training. The Act makes it obligatory for employers in specified industries to engage apprentices in designated trades to impart on the job training for school leavers, and ITI passed outs to develop skilled manpower for the industry.
- The Ministry is implementing the Employable Scheme (MES) under the Skill Development Initiative Scheme to provide vocational training to people to develop skilled manpower for the industry through a network of Vocational Training Providers (VTPs) located across the country.

Central Staff Training and Research Institute (CSTARI), Kolkata is the nodal institute for the development/revision of curricula under all vocational training schemes of the Ministry. National Instructional Media Institute (NIMI), Chennai is to make available instructional material in various trades for the use of trainees and trainers to ensure overall

improvement in the standard of institutional training under the CTS and ATS schemes. The institute is actively involved in the development, production and dissemination of instructional media Packages (IMPs) comprising of books on Trade Theory, Trade Practical, Test/Assignment, and Instructor's Guide.

The National Skills Qualification Framework (NSQF), published in the Gazette of India on 27th December, 2013, is a national framework that aims to integrate general and vocational streams of education and training. The main goal of the NSQF is to focus on competency-based qualifications, which in turn facilitate and enhance transparency, both within and between general and vocational streams. The National Skill Development Agency (NSDA) under the Ministry is responsible for anchoring and implementation of the Framework, by bringing together the key stakeholders through the National Skill Qualifications Committee (NSQC).

The competency-based framework organizes qualifications into ten levels, with the entry level being 1, and the highest level being 10. Each level of the NSQF is described by a statement of learning outcomes in five domains, known as level descriptors. These five domains are (1) Process, (2) Professional knowledge, (3) Professional skill, (4) core skill, and (5) Responsibility. The paradigm shift from learning focused on inputs to an outcome/competency-based education would help in the Recognition of Prior Learning (RPL), and simultaneously enable the alignment of the Indian qualifications with international ones. Government funding is expected to be on a preferential basis for NSQF compliant courses. The NSQF notification provides a Qualification Register, which is the official national database of all qualifications aligned to NSQF levels. Through this Register, learners can expect access to all NSQF compliant qualifications.

The Ministry has set up Mentor Councils to focus on courses under NCVT in various sectors with representation from thought leaders among different stakeholders viz., industries, innovative entrepreneurs who have proved to be game-changers, academic/professional institutions, and champion ITIs for each of the sectors. The Mentor Council for each sector reviews curriculum, admission criteria, course duration, and requirement of trainers and assessment/evaluation systems for the sector on a continuous basis and make recommendations regarding the same. Sector-wise Core Groups are formed to plan and prepare the documentation for the competency-based curricula for the courses under each sector.

2. GENERAL INFORMATION

1	Qualification	Milk and Milk Products
2	N.C.O./NOS Code No.	7413.90
3	NSQF Level	Level 4
4	Duration of the course/qualification	One year (Two semesters)
5	Entry Qualification	Passed 10th Class with Science and Mathematics
6	Trainees per unit	20

Note:

- i) Out of the two Instructors required for a unit of 2(1+1), one must have Degree/Diploma, and other must have NTC/NAC qualifications, in the relevant field.

Distribution of notional training hours of the training per week:

Total hours /week	Trade practical	Trade theory	Employability skills	Extra-curricular activity
40 Hours	30 Hours	6 Hours	2 Hours	2 Hours

3. COURSE STRUCTURE

Name of the Qualification: Milk and Milk Products

Total duration of the course: 12 Months

Training duration details:

Course Elements	Hourly Distribution
Professional Skills	1320 hrs
Professional Knowledge	264 hrs
Employability Skills	88 hrs
Extra Curricular Activities	88 hrs
In-plant Training/Project Work	160 hrs
Admission & Examination	160 hrs
Total	2080 hrs

4. JOB ROLES

4.1 Brief description

This course is meant for the candidates who aspire to become:

- Quality Analyst in milk plants
- Supervisor in milk plants.
- Packaging Supervisor in milk plants.
- Skilled Worker in Food MNC.
- Entrepreneur in milk and milk products

4.2 NOS & QP/NCO Mapping:

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5. NSQF LEVEL COMPLIANCE

The Broad Learning outcomes of Milk and Milk Products trade under CTS matches with the Level descriptor at Level 4.

The NSQF level 4 descriptor is given below:

LEVEL	Process required	Professional knowledge	Professional skill	Core skill	Responsibility
Level 4	work in familiar, predictable, routine, situation of clear choice	factual knowledge of field of knowledge or study	recall and demonstrate practical skill, routine and repetitive in narrow range of application, using appropriate rule and tool, using quality concepts	language to communicate written or oral, with required clarity, skill to basic Arithmetic and algebraic principles, basic understanding of social political and natural environment	Responsibility for own work and learning.

6. GENERAL TRAINING PLAN, EXAMINATION & PASS REGULATION

General Training Plan

The knowledge and skill components as stated in the section for 'learning outcomes' are to be imparted in accordance with the instructions in respect of the content and time structure.

Assessment

The assessment for the semester-based qualification is carried out by conducting formative assessments, and end-of-semester examinations, as per the guidelines given in the Curriculum. The internal assessments for theory subjects and practical are conducted for evaluating the knowledge and skill acquired by trainees and the behavioural transformation of the trainees as per the learning outcomes. Theory examinations are conducted in Trade Theory, Workshop Calculation & Science, Engineering Drawing and Employability Skills. Trade practical examinations are conducted by the respective State Governments. The details of the examination and assessment standard are in a latter section. NCVT prepares the question papers for the Trade practical. Candidates are to demonstrate that they can:

1. Read & interpret technical parameters/documentation, plan and organize work processes, and identify necessary materials and tools,
2. Perform a task/job with due consideration to safety rules, accident prevention regulations and environmental protection stipulations,
3. Apply Professional Knowledge, Core Skills, and Employability Skills while performing the task/job.
4. Check the task/job as per the drawing for proper functioning, and identify and rectify errors in the job, if any.
5. Document the technical parameters related to the task/job.

Pass regulation

For the purposes of determining the overall result, weightage of 25 percent is applied to each semester examination. The minimum pass percent for Practical is 60% & minimum pass percent for Theory subject is 40%.

7. LEARNING OUTCOMES

The following are minimum broad learning outcomes after completion of the Milk and Milk Products course of [Duration of course]-1 year duration:

A. GENERIC OUTCOMES

1. Recognize & comply safe working practices, environment regulation and housekeeping.
2. Work in a team, understand and practice soft skills, technical English to communicate with required clarity.
3. Understand and explain the concept in quality tools and labour welfare legislation and apply such in day to day work to improve productivity & quality.
4. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.
5. Explain entrepreneurship and manage/organize related task in day to day work for personal & societal growth.
6. Understand and apply basic computer working, basic operating system and uses internet services to get accustomed & take benefit of IT developments in the industry.

B. SPECIFIC OUTCOMES

SEMESTER – I

1. Describe importance of market for dairy products
2. Explain various types of packaging material
3. Demonstrate mini dairy plant with safety precautions.
4. Check the quality of raw milk by using milk by using the appropriate machines/ tools /chemical solutions with safety precautions.
5. Prepare Pasteurized milk, Standard milk, Toned milk, Double toned milk, Flavoured milk, Fermented milk, Concentrated milk, Condensed milk. Bulgarian milk and Acidophilus milk by using the appropriate machines machines/ tools /chemical solutions with safety precautions and determine the quality test

SEMESTER - II

1. Prepare cheese, paneer, channa, mawa, dahi, srikhand, buttermilk, lassi and milk cake by using the appropriate machines / tools with safety precautions and determine the quality test.
2. Prepare cream, butter and ghee by using the appropriate machines/ tools /chemical solutions with safety precautions and determine the quality test.
3. Prepare different type of ice cream and kulfi by using the appropriate machines/ tools /chemical solutions with safety precautions and determine the quality test.
4. Prepare dried milk powder by using the spray drier with safety precautions and determine the quality test.
5. Demonstrate waste utilization and explain food safety standards.

6. Perform different cleaning and sanitizing process by using the appropriate chemicals with safety precautions

8. ASSESSABLE OUTCOMES WITH ASSESSMENT CRITERIA

Note:

1. The training shall be conducted as per the syllabus.
2. The trainee shall demonstrate the competencies that are defined below in the assessable outcomes highlighted below.
3. The trainee shall be assessed for his/her achievement levels in all the assessable outcomes on the basis of the formative assessment, Theory & Practical examinations, observation, and viva-voce.
4. The trainee shall be assessed for his/her achievement levels in all the assessable outcomes of the Employability Skills on the basis of Theory Examinations, and for his/her ability to apply the concepts in Practical.
5. The assessable outcomes and assessment criteria will serve as a set of guidelines for Trainers, Paper setters, Moderators, and Assessors.

Assessable outcomes along with assessment criteria to be achieved after each semester and completion of qualification:

Generic assessable outcomes:

ASSESSABLE OUTCOMES	ASSESSMENT CRITERIA
1. Recognize & comply safe working practices, environment regulation and housekeeping.	1.1 Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements and according to site policy.
	1.2 Recognize and report all unsafe situations according to site policy.
	1.3 Identify and take necessary precautions on fire and safety hazards and report according to site policy and procedures.
	1.4 Identify, handle and store / dispose off dangerous goods and substances according to site policy and procedures following safety regulations and requirements.
	1.5 Identify and observe site policies and procedures in regard to illness or accident.
	1.6 Identify safety alarms accurately.
	1.7 Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly according to site accident/injury procedures.
	1.8 Identify and observe site evacuation procedures according to site policy.
	1.9 Identify Personal Protective Equipment (PPE) and use the same as per related working environment.
	1.10 Identify basic first aid and use them under different circumstances.
	1.11 Identify different fire extinguisher and use the same as per requirement.
	1.12 Identify environmental pollution & contribute to the avoidance

	<p>of instances of environmental pollution.</p> <p>1.13 Deploy environmental protection legislation & regulations</p> <p>1.14 Take opportunities to use energy and materials in an environmentally friendly manner</p> <p>1.15 Avoid waste and dispose waste as per procedure</p> <p>1.16 Recognize different components of 5S and apply the same in the working environment.</p>
2. Work in a team, understand and practice soft skills, technical English to communicate with required clarity.	<p>2.1 Obtain sources of information and recognize information.</p> <p>2.2 Use and draw up technical drawings and documents.</p> <p>2.3 Use documents and technical regulations and occupationally related provisions.</p> <p>2.4 Conduct appropriate and target oriented discussions with higher authority and within the team.</p> <p>2.5 Present facts and circumstances, possible solutions & use English special terminology.</p> <p>2.6 Resolve disputes within the team</p> <p>2.7 Conduct written communication.</p>
3. Understand and explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.	<p>3.1 Semester examination to test the concept in productivity, quality tools and labour welfare legislation.</p> <p>3.2 Their applications will also be assessed during execution of assessable outcome.</p>
4. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.	<p>4.1 Semester examination to test knowledge on energy conservation, global warming and pollution.</p> <p>4.2 Their applications will also be assessed during execution of assessable outcome.</p>
5. Explain entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	<p>5.1 Semester examination to test knowledge on entrepreneurship.</p> <p>5.2 It's applications will also be assessed during execution of assessable outcome.</p>
6. Understand and apply basic computer working, basic operating system, simulate part programme using simulation software and uses internet services to get accustomed & take benefit of IT developments in the industry.	<p>6.1 Semester examination to test knowledge on basic computer working, basic operating system and uses internet services.</p> <p>6.2 Their applications will also be assessed during execution of assessable outcome.</p>

B. SPECIFIC OUTCOMES

Semester-I

ASSESSABLE OUT COME	ASSESSMENT CRITERIA
Describe importance of market for dairy products	<ul style="list-style-type: none">• Identify milk products.• Describe the component of milk such as water , fat, lactose protein• Classify milk product by bases of fat• Describe importance of milk product and dairy market
Explain various types of packaging material	<ul style="list-style-type: none">• Identify packaging material by physical parameters.• Describe the importance of packaging material.• Describe the importance of storage and labeling.• Describe different method of storage.• Explain type of packaging material like poly pouch, rigid semi rigid flexible forms, retortable pouch, tetrapack.
Demonstrate mini dairy plant with safety precautions.	<ul style="list-style-type: none">• Maintain perfect hygienic standards• Describe the safety measures should be observed at the mini dairy plant.• Describe how one should be aware and handle emergency situations.• Explain concept of mini dairy plant.• Explain the importance of milk production as a source of livelihood and increasing production of processed milk product.• Describe the factors affecting demand and supply of processed milk product.• Demonstrate / operate mini dairy plant.• Clean sanitize and assemble all part of equipment.• Identify basic faults and rectify.

	<ul style="list-style-type: none"> • Safety and maintenance.
<p>Check the quality of raw milk by using milk by using the appropriate machines/ tools /chemical solutions with safety precautions.</p>	<ul style="list-style-type: none"> • Collect sample of milk for testing. • Check physical examination or plate form test such as organoleptic tests, clot on boiling test, alcohol test and acidity test. • Determine Fat test by Gerber method. • Demonstrate specific gravity by lacto meter. • Check SNF content in milk • Detect the adulterants such as pond water, urea, sugar and caustic in milk. • Check the microbial quality of milk by MBRT and SPC tests. • Maintain safety precautions.
<p>Prepare Pasteurized milk, Standard milk, Toned milk, Double toned milk, Flavoured milk, Fermented milk, Concentrated milk, Condensed milk. Bulgarian milk and Acidophilus milk by using the appropriate machines machines/ tools /chemical solutions with safety precautions and determine the quality test.</p>	<ul style="list-style-type: none"> • Explain principle of processing of milk. • Explain pasteurization methods and sterilization. • Maintain perfect hygienic standards • Select raw milk and ingredients. • Pre-processing tests of milk such as organoleptic tests, clot on boiling test, alcohol test and acidity test. . • Processing of milk such as pasteurization, sterilization, and homogenization as per product to be preparing. • Perform calculation. • Prepare milks such as Pasteurized milk, Standard milk, Toned milk, Double toned milk, Flavoured milk, Fermented milk, Concentrated milk, Condensed milk. Bulgarian milk and Acidophilus milk by using

	<p>appropriate machines.</p> <ul style="list-style-type: none"> • Test SNF and Fat content. • Fill milk into pouches by using Form fill seal machines. • Store milk • Maintain safety precautions
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Semester-II

9. SYLLABUS CONTENT WITH TIME STRUCTURE

SYLLABUS FOR THE TRADE OF MILK AND MILK PRODUCTS

9.1 Syllabus Content for Professional Skill & Knowledge

First Semester

Duration: Six Months

Learning Objectives (1st Semester)

- 1.
- 2.

Detailed Syllabus:

MILK AND MILK PRODUCTS		
SYLLABUS: FIRST SEMESTER		
Sl. No	Practical	Theory
1-3	<ul style="list-style-type: none"> • Conduct market survey of different dairy products available. • Survey of availability of the raw material for dairy industry • Visit and study of a dairy plant. 	<ul style="list-style-type: none"> • Status of dairy industries in India. • Introduction of white revolution. • Importance of dairy industry opportunities of employment in the Dairy Industry.

4-6	<ul style="list-style-type: none"> • Study of Packaging Materials used in dairy industry. • Study of objective and functions of packaging and packaging materials. • Study of packaging equipments and machinery used in dairy industry. • Collection of various types of packaging material used for the packaging of dairy products. • Need and importance of storage and packaging methods of dairy products. 	<ul style="list-style-type: none"> • Overview of Food Spoilage: Bacterial and fungal food spoilage. Food poisoning, Food born infection and Food born intoxication. • Main causes of milk spoilage. Preventions of milk and milk products from spoilage (Microbial spoilage)
7-11	<p>Testing of milk for its quality.</p> <ul style="list-style-type: none"> • Sampling of milk. • To perform physical examination of milk. • To perform platform tests of milk like organoleptic tests, clot on boiling test, alcohol test and acidity test. • Estimation of fat by Gerber method. • Estimation of specific gravity of milk by lactometer. • Estimation of SNF content in milk. • Detection of various adulterants in milk. • To ascertain microbiological quality of milk by MBRT and SPC. 	<ul style="list-style-type: none"> • Definition of milk. • Composition and physico-thermal property of milk. • Collection of raw milk. • Method of Sampling of raw milk. • Plat form test. • Quality of raw milk. • Different products made from the milk. • Introduction to different dairy products useful for marketing. • Principle and methods used for milk processing.
12-16	<ul style="list-style-type: none"> • Care and maintenance of equipments. • Handling of equipments safely. • Fault identification and removal of faults. • Corrective and Preventive action for safe operation. 	<p>Study and working of equipments used e.g.</p> <ul style="list-style-type: none"> • Single and two stage homogenizers. • Batch, Flash, and Continues pasteurizer. • Spray Drier and Drum Drier. • Evaporators (Different Type) • Cream Separator. • Deep freezer. • Softy making machine. • Ice cream freezer. • Cheese vat. • Jacket kettle. • Butter churner. • Boiler. • Optionally mini dairy plant. • Form fill seal machine. • Centrifugal Machine.

17-22	<p>Preparation of</p> <ul style="list-style-type: none"> • Pasteurized milk • Standard milk • Toned milk • Double toned milk • Flavoured milk. • Fermented milk • Concentrated milk. • Condensed milk • Bulgarian milk • Acidophilus milk <p>Store product hygienically. Conduct primary processing of market milk & store. Practical Demonstration on Form fill seal machine.</p>	<ul style="list-style-type: none"> • Principle of thermal processing of milk processing. • Pasteurization and Sterilizations of milk. • UHT Processing of milk. • Methods for production of different types of milks - pasteurized, standard, toned, double toned, flavoured milk. Ingredients of special milks, fermented milk, concentrated milk. • Other dairy products like dried milk, condensed milk. • Standards of milk and milk products. • Condensed milk: Composition, production, and defects. • Fermented dairy products: Production of Bulgarian milk, Acidophilus milk.
23-25	Industrial Training in Dairy industry	
26	Revision/Examination	

Second Semester (Semester Code No. _____)

Duration: Six Months

Learning Objectives (2nd Semester)

1.

Detailed Syllabus:

MILK AND MILK PRODUCTS		
SYLLABUS: SECOND SEMESTER		
Sl. No	Practical	Theory
1-2	<ul style="list-style-type: none"> Conduct market survey of different dairy products available. 	<ul style="list-style-type: none"> Introduction of basic unit operations involved in the processing of milk and milk products.
3-6	<p>Preparation of</p> <ul style="list-style-type: none"> Cream Butter Ghee <p>Analysis of various quality parameters of prepared dairy products as cream, butter and ghee. To demonstrate the effect of temperature on the rate of cream separation under the influence of gravity. Pack the given dairy products and seal.</p>	<ul style="list-style-type: none"> Cream: Composition, production and defects. Different types of creams and their production method. Butter: Composition, method of production, theories of churning, grading and prevention of defects. Quality of butter. Ghee: Compositions, Different methods of Ghee production Quality of ghee.
7-9	<p>Preparation of</p> <ul style="list-style-type: none"> Processed cheese. Paneer. Channa Mawa Dahi Srikhand Buttermilk Milk cake <p>Pack the given dairy products and seal</p>	<ul style="list-style-type: none"> Cheese: Composition, types of cheese, production of cottage and cheddar cheeses; defects. Paneer: Composition, Production; defects. Indian dairy products: Rabri, kulfi, srikhand, lassi, Mawa, Dahi , Butter milk, Channa
10-14	<ul style="list-style-type: none"> To prepare different types of ice cream from a commercially available ice cream mix and to study defects in ice cream. <p>Quality evaluation of ice cream.</p> <ul style="list-style-type: none"> To determine percentage overrun of commercially prepared ice-cream. <p>Pack the given dairy products and seal. Storage methods of ice-cream.</p>	<ul style="list-style-type: none"> Principle of homogenization. Application of homogenization in dairy industry. Ice cream: Definition and composition, Role of ingredients used, Principles and Technology of ice-cream manufacturing, grading and prevention of defects in ice creams. Freezing method and equipment used.

15-18	<p>Demonstration on dairy products like</p> <ul style="list-style-type: none"> • Dried milk (spray dried) <p>Determination of solubility index of dried milk powder.</p> <p>Analysis of various quality parameters of prepared dried milk.</p> <p>Pack the given dairy products, seal and storage.</p>	<ul style="list-style-type: none"> • Drying Theories, • Dried milk: Definition and composition, production by drum drying and air spray system; defects; dried milk products–butter-milk powder, whey powder, cream powder, infant milk food. • Drying Equipment: Spray Drier, Drum Drier
19-20	<p>Application of HACCP and GMP in a Dairy plant.</p> <p>Utilization of dairy industry wastes: Whey utilization; production of casein and lactose.</p>	<ul style="list-style-type: none"> • Food regulations :Overview of Food Safety and Standards Act, 2006 BIS, ISO-22000, Agmark, HACCP, International Food Standards GMP. Importance of personal Hygiene, Cleaning & Sanitary standards of dairy industry.
21-22	<ul style="list-style-type: none"> • Washing of equipments used in dairy industry. • Maintenance of can washer. • Steam sterilization of canes. • CIP of dairy equipments. 	<ul style="list-style-type: none"> • Selection and use of dairy cleaners and sanitizers. • Cleaning in place system (CIP), • Various chemical used for CIP of dairy plant. • Factor affecting washing operation.
23-25	Industrial Training in Dairy Industry	
26	Revision/Examination	

9.2 SYLLABUS CONTENT OF EMPLOYABILITY SKILLS

General Information

Name of the subject	: EMPLOYABILITY SKILLS																		
Applicability	: CTS- Mandatory for all trades ATS- Mandatory for fresher only																		
Hours of Instruction	110 Hrs.																		
Examination	: The examination shall be held at the end of semesters.																		
Instructor Qualification	<ul style="list-style-type: none"> • MBA or BBA with two years' experience or Graduate in Sociology/ Social Welfare/ Economics with Two years' experience or Graduate/ Diploma with Two years' experience and trained in Employability Skills from ITIs and • Must have studied English/ Communication Skills and Basic Computer at 12th / Diploma level and above or • Existing Social Studies Instructors duly trained in Employability Skills from DGT institutes 																		
Instructor	<p>One full time regular instructor shall be engaged on every 240 number of trainees for teaching the subject 'Employability Skills'. One additional full time regular instructor would be required on increase in every 240 trainees. Wherever the trainees are less than 240 or part thereof, a part-time instructor may be engaged to teach the subject. This has been illustrated in the table below:</p> <table border="1"> <thead> <tr> <th>S. No.</th> <th>Number of trainees</th> <th>Instructor (s) required</th> </tr> </thead> <tbody> <tr> <td>a)</td> <td>Less than 240</td> <td>One part-time Instructor</td> </tr> <tr> <td>b)</td> <td>240</td> <td>One full-time Instructor</td> </tr> <tr> <td>c)</td> <td>Between 240 and 480</td> <td>One full-time Instructor + One part-time Instructor</td> </tr> <tr> <td>d)</td> <td>Between 480 and 720</td> <td>Two full-time Instructors + One part-time Instructor</td> </tr> <tr> <td>e)</td> <td>Between 720 and 960</td> <td>Three full-time Instructors + One part-time Instructor</td> </tr> </tbody> </table>	S. No.	Number of trainees	Instructor (s) required	a)	Less than 240	One part-time Instructor	b)	240	One full-time Instructor	c)	Between 240 and 480	One full-time Instructor + One part-time Instructor	d)	Between 480 and 720	Two full-time Instructors + One part-time Instructor	e)	Between 720 and 960	Three full-time Instructors + One part-time Instructor
S. No.	Number of trainees	Instructor (s) required																	
a)	Less than 240	One part-time Instructor																	
b)	240	One full-time Instructor																	
c)	Between 240 and 480	One full-time Instructor + One part-time Instructor																	
d)	Between 480 and 720	Two full-time Instructors + One part-time Instructor																	
e)	Between 720 and 960	Three full-time Instructors + One part-time Instructor																	

Semester-wise Distribution of Topics (Employability Skill)

Course Duration	Topics		Examination
	Semester 1	Semester 2	
01 Year (Two semesters)	1. English Literacy 2. I.T. Literacy 3. Communication Skills	1. Entrepreneurship Skills 2. Productivity 3. Occupational Safety , Health, and Environment Education	Final examination at the end of second semester

		4. Labour Welfare 5. Legislation 6. Quality Tools	
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Syllabus Content for Employability Skills

Semester 1

Learning Objectives (1st semester)

1. Read, write and communicate in English language for day to day work.
2. Communicate in written and oral and with required clarity ensuring that the information communicated is clear, concise and accurate.
3. Understand and apply basic computer working, basic operating system and uses internet services to get accustomed & take benefit of IT developments in the industry.

Detailed Syllabus

1. English Literacy	
Hours of Instruction: 20 Hrs.	
Marks Allotted: 09	
Pronunciation	Accentuation (mode of pronunciation) on simple words, Diction (use of word and speech)
Functional Grammar	Transformation of sentences, Voice change, Change of tense, Spellings.
Reading	Reading and understanding simple sentences about self, work and environment
Writing	Construction of simple sentences Writing simple English
Speaking / Spoken English	Speaking with preparation on self, on family, on friends/ classmates, on know, picture reading gain confidence through role-playing and discussions on current happening job description, asking about someone's job habitual actions. Cardinal (fundamental) numbers ordinal numbers. Taking messages, passing messages on and filling in message forms Greeting and introductions office hospitality, Resumes or curriculum vita essential parts, letters of application reference to previous communication.
2. I.T. Literacy	
Hours of Instruction: 20 Hrs.	
Marks Allotted: 09	
Basics of Computer	Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer.
Computer Operating System	Basics of Operating System, WINDOWS, The user interface of Windows OS, Create, Copy, Move and delete Files and Folders, Use of External memory like pen drive, CD, DVD etc, Use of Common applications.
Word processing and Worksheet	Basic operating of Word Processing, Creating, opening and closing Documents, use of shortcuts, Creating and Editing of Text, Formatting the Text, Insertion & creation of Tables. Printing document. Basics of Excel worksheet, understanding basic commands, creating simple

	worksheets, understanding sample worksheets, use of simple formulas and functions, Printing of simple excel sheets
Computer Networking and INTERNET	Basic of computer Networks (using real life examples), Definitions of Local Area Network (LAN), Wide Area Network (WAN), Internet, Concept of Internet (Network of Networks), Meaning of World Wide Web (WWW), Web Browser, Web Site, Web page and Search Engines. Accessing the Internet using Web Browser, Downloading and Printing Web Pages, Opening an email account and use of email. Social media sites and its implication. Information Security and antivirus tools, Do's and Don'ts in Information Security, Awareness of IT – ACT, types of cyber crimes.

3. Communication Skills

Hour of Instruction: 15 Hrs.Marks Allotted: 07

Topic	Contents
Introduction to Communication Skills	Communication and its importance
	Principles of Effective communication
	Types of communication – verbal, nonverbal, written, email, talking on phone.
	Nonverbal communication –characteristics, components- Para-language
	Body – language
	Barriers to communication and dealing with barriers.
	Handling nervousness/ discomfort.
Listening Skills	Listening-hearing and listening, effective listening, barriers to effective listening guidelines for effective listening.
	Triple- A Listening – Attitude, Attention & Adjustment.
	Active Listening Skills.
Motivational Training	Characteristics Essential to Achieving Success
	The Power of Positive Attitude
	Self-awareness
	Importance of Commitment
	Ethics and Values
	Ways to Motivate Oneself
	Personal Goal setting and Employability Planning.
Facing Interviews	Manners, Etiquettes, Dress code for an interview
	Do's & Don'ts for an interview
Behavioral Skills	Problem Solving
	Confidence Building

Semester 2

Learning Objectives (2nd Semester)

1. Knowledge of business activities, ability to interact with consumers for development of businesses.
2. Understand and apply productivity, its benefits and factors affecting the productivity.
3. Follow and maintain procedures to achieve a safe working environment in line with occupational health, safety, environment regulations and Labour welfare legislation and requirements.
4. Understand and apply quality concepts as per ISO and BIS system and its importance.
5. Recognize different components of 5S and apply the same in the working environment.

Detailed Syllabus

4. Entrepreneurship skill Hour of Instruction: 15 Hrs.Marks Allotted: 06	
Topic	Content
Business & Consumer:	Types of business in different trades and the importance of skill, Understanding the consumer, market through consumer behavior, market survey, Methods of Marketing, publicity and advertisement
Self Employment:	Need and scope for self-employment, Qualities of a good Entrepreneur (values attitude, motive, etc.), SWOT and Risk Analysis
Govt Institutions :	Role of various Schemes and Institutes for self-employment i.e. DIC, SIDBI, MSME, NSIC, Financial institutions and banks
Initiation Formalities :	Project Formation, Feasibility, Legal formalities i.e., Shop Act, Estimation & Costing, Investment Procedure - Loan Procurement - Agencies - banking Process
5. Productivity Hour of Instruction: 10 Hrs.Marks Allotted: 05	
Productivity	Definition, Necessity, Meaning of GDP.
Benefits	Personal / Workman – Incentive, Production linked Bonus, Improvement in living standard. Industry Nation.

Affecting Factors	Skills, Working Aids, Automation, Environment, Motivation How improves or slows down.
Comparison with developed countries	Comparative productivity in developed countries (viz. Germany, Japan and Australia) in selected industries e.g. Manufacturing, Steel, Mining, Construction etc. Living standards of those countries, wages.
Personal Finance Management	Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance.
6. Occupational Safety, Health & Environment Hour of Instruction: 15 Hrs.Marks Allotted: 06	
Safety & Health :	Introduction to Occupational Safety and Health and its importance at workplace
Occupational Hazards :	Occupational health, Occupational hygiene, Occupational Diseases/ Disorders & its prevention
Accident & safety :	Accident prevention techniques- control of accidents and safety measures
First Aid :	Care of injured & Sick at the workplaces, First-aid & Transportation of sick person
Basic Provisions :	Idea of basic provisions of safety, health, welfare under legislation of India
7.Labour Welfare Legislation Hour of Instruction: 05 Hrs.Marks Allotted: 03	
Labour Welfare Legislation	Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, The Workmen” s Compensation Act
8.Quality Tools Hour of Instruction: 10 Hrs.Marks Allotted: 05	
Quality Consciousness :	Meaning of quality, Quality Characteristic
Quality Circles :	Definition, Advantage of small group activity, objectives of Quality Circle, Roles and Functions of Quality Circles in organisation, Operation of Quality Circle, Approaches to Starting Quality Circles, Steps for Continuation Quality Circles
Quality Management System:	Idea of ISO 9000 and BIS systems and its importance in maintaining qualities.
House Keeping :	Purpose of Housekeeping, Practice of good Housekeeping.5S Principles of Housekeeping: SEIRI – Segregation, SEITON –

	Arrangement, SEISO – Cleaning, SEIKETSU – maintenance of Standards, SHITSUKE - Discipline
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10. INFRASTRUCTURE

1. Instructors' Qualification	(i) National Trade Certificate in milk and milk products trade with three years experience in relevant industry. OR (ii) Diploma in Food Technology/ Dairy Technology with two years experience in relevant industry. OR (iii) Degree in Food Technology/Dairy technology with one years experience in relevant industry.
Desirable qualification	Preference will be given to craft instructor's certificate (CIC).
3. Space Norms	Lab Space – 96 Sq. m Class Room Space -30 Sq. m
4. Power Norms	6 KW
5. Tools, Equipment & General Machinery	(As per Annexure II)

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Note:

- (i) Out of two Instructors required for the unit of 2(1+1), one must have Degree/Diploma and other must have NTC/NAC qualifications.

11. ASSESSMENT STANDARD

11.1ASSESSMENT GUIDELINES:

Appropriate arrangements should be made to ensure that there will be no artificial barriers to assessment. The nature of special needs should be taken into account while undertaking the assessment. Due consideration shall be given while assessing for teamwork, avoidance/reduction of scrap/wastage and disposal of scarp/wastage as per procedure, behavioral attitude, sensitive to environment and regularity in training. The sensitivity towards OSHE and self-learning attitude shall be considered while assessing competency.

Assessment shall be evidence based comprising the following:

- 1) Job carried out in labs/workshop
- 2) Record book/ daily diary
- 3) Answer sheet for assessment
- 4) Viva-voce
- 5) Progress Chart
- 6) Attendance and punctuality
- 7) Assignment
- 8) Project work

Evidence of internal assessment should be preserved for an appropriate period of time for audit and verification by examination body.

The following marking pattern to be adopted while assessing:

a) Weightage in the range of 60-75% to be allotted during assessment under following performance level:

For performance in this grade, the candidate with occasional guidance and showing due regard for safety procedures and practices, has produced work that demonstrates attainment of an acceptable standard of craftsmanship. In this work there is evidence of:

- Demonstration of good skill in the use of hand tools, machine tools, and workshop equipment
- Below 70% tolerance dimension achieved while undertaking different work with those demanded by the component/job.
- A fairly good level of neatness and consistency in the finish
- Occasional support in completing the project/job.

b) Weightage in the range of above75%- 90% to be allotted during assessment under following performance level:

For this grade, the candidate, with little guidance and showing due regard for safety procedures and practices, has produced work that demonstrates attainment of a reasonable standard of craftsmanship. In this work there is evidence of:

- Good skill levels in the use of hand tools, machine tools, and workshop equipment
- 70-80% tolerance dimension achieved while undertaking different work with those demanded by the component/job.
- A good level of neatness and consistency in the finish
- Little support in completing the project/job

c) Weightage in the range of above 90% to be allotted during assessment under following performance level:

For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship. In this work there is evidence of:

- High skill levels in the use of hand tools, machine tools, and workshop equipment
- Above 80% tolerance dimension achieved while undertaking different work with those demanded by the component/job.
- A high level of neatness and consistency in the finish.
- Minimal or no support in completing the project.

11.2. INTERNAL ASSESSMENT (FORMATIVE ASSESSMENT)

Comp. No.	ASSESSABLE OUTCOME	INTERNAL ASSESSMENT Marks
GENERIC		
1.	Recognize & comply safe working practices, environment regulation and housekeeping.	
2.	Work in a team, understand and practice soft skills, technical English to communicate with required clarity.	
3.	Explain energy conservation, global warming, and pollution and contribute in the day to day work by optimally using available resources.	
4.	Explain personnel finance, entrepreneurship, and manage/organize related task in the day to day work for personal & societal growth.	
5.	Understand and apply basic computer working, basic operating system, simulate part program using simulation software and uses internet services to get accustomed & take benefit of IT developments in the industry.	
SPECIFIC		
1.	Describe importance of market for dairy products	
2.	Explain various types of packaging material	
3.	Identify spices and food additives by visual inspection.	
4.	Demonstrate mini dairy plant with safety precautions.	
5.	Check the quality of raw milk by using milk by using the appropriate machines/ tools /chemical solutions with safety precautions.	
6.	Prepare Pasteurized milk, Standard milk, Toned milk, Double toned milk, Flavoured milk, Fermented milk, Concentrated milk, Condensed milk. Bulgarian milk and Acidophilus milk by using the appropriate machines machines/ tools /chemical solutions with safety precautions and determine the quality test	
Sub-Total of Internal assessment for Semester- I		20

1.	Prepare cheese, paneer, channa, mawa, dahi, srikhand, buttermilk, lassi and milk cake by using the appropriate machines / tools with safety precautions and determine the quality test.	
2.	Prepare cream, butter and ghee by using the appropriate machines/ tools /chemical solutions with safety precautions and determine the quality test.	
3.	Prepare different type of ice cream and kulfi by using the appropriate machines/ tools /chemical solutions with safety precautions and determine the quality test.	
4.	Prepare dried milk powder by using the spray drier with safety precautions and determine the quality test.	
5.	Demonstrate waste utilization and explain food safety standards.	
6.	Perform different cleaning and sanitizing process by using the appropriate chemicals with safety precautions	
	Sub-Total of Internal assessment for Semester- II	20
	Total of Internal Assessment	40

Note: The generic outcome to be assessed along with the specific outcome.

11.3 FINAL ASSESSMENT- All India Trade TEST (SUMMATIVE ASSESSMENT)

- There will be a single objective type Examination paper for the subjects Trade Theory and Employability Skills.
- The two objective type Examination papers as mentioned above will be conducted by National Council for Vocational Training (NCVT), whereas examination for the subject Trade Practical will be conducted by the State Government. NCVT shall supply the Question Paper for the subject Trade Practical.

Marking Pattern		
Sl. No.	Subject for the trade test	Maximum marks for the each subject
a)	Practical	100
b)	Trade Theory	80
c)	Employability Skills	Objective type Written test of 80 marks (Trade Theory 30 marks & Employability Skills 50 marks)
d)	Internal assessment	20
TOTAL:		200

Annexure - I
TRADE: MILK AND MILK PRODUCTS
LIST OF TOOLS & EQUIPMENTS

Equipment, Machine & Tools		
Sl. No.	Item/ Specification	Quantity proposed for a batch of 20 trainees
1	Mini dairy plant: Complete Mini- processing unit for milk.	1
2	Milk Chiller : For chilling milk up to a temperature of about –10 °C	1
3	Milk cans : Made of steel/ Aluminium, 40 –100 lit capacity	As required
4	Cream separator : Motor operated, Centrifugal, capacity up to 1-2 Kg/ cream per min.	1
5	Cheese vat : Made of heavy Stainless steel (306), size approx. 4’X 2.5’X 1’ with proper outlet and taps	1
6	Plate pasteurizer (Lab model)	1
7	Butter churner	1
8	Boiler (Lab scale)	1
9	Deep fridge	1
10	Steam jacketed kettle with surface scrapper	1
11	Mawa machine	1
12	Crown corking machine	1
13	Form fill seal machine	1
14	Ice cream plant	1
15	Centrifuge : For Fat estimation in milk,	1
16	Gerber tubes for fat estimation	1
17	Electric oven	1
18	Desicator	1
19	Weight balances Digital (min 10 gm to max 5 kg)	1
20	Jacket Kettle	1
21	Flash evaporator.	1
22	Can body reformer	1
23	Can seamer	1
24	Exhaust box.	1
25	Cup sealer	1
26	Vacuum pan	1
27	Vernier caliper : 15 cm. 0.01 mm LC	2
28	Screw Gauge : Micrometer, 0.001 mm LC,10 cm cap	4
29	Steel scale : 12 “ standard steel	2
30	Steel Measuring tape : Scales 1 meter, and of 50 ft	2

31	Weight balances Digital(min 0.01gm to max 1kg)	1
32	Cutting equipments : Different knives,	As required
33	Sinks : standard size	1
34	Hot plate : Electrical 2 KW	1
35	Spray drier (Lab Scale)	1
36	Heat sealing machine : Hand / pedal operated	1
37	Tanks SS : 50 litres capacity, cylindrical with cap	1
38	Syrup tanks : 50, 100 lit capacity SS	1
39	Pressure cooker : 5 Kg and 10 Kg SS	1
40	Liquid filling machine : For filling liquid in bottles, 200 ml, 500 ml, 1000 ml. Manual	As required
41	SS filter : Sieve type cloth filter, hydraulic,	1
42	Sugar Coating pan : SS, Revolving type with speed control,	1
43	Bottle opener : Heavy duty, Stainless Steel	1
44	Burette with stand : 50 ml ordinary glass	1
45	Pipette : 5-50 ml capacities, glass	As required
46	Lab glassware's : Different sizes and types	As required
47	Working tables : Stainless Steel Size 6' X 3'	1
48	Improved stoves : Made of MS with proper safety Measures, Valves etc	1
49	Stainless steel / Aluminium pots : Different Capacities	As required
50	Wooden spoons : Different sizes	As required
A)	Furniture	
	Class Room	
	Instructor Chair & Table	01 No
	Dual Desk	10 No.
	Workshop/Lab	
	Suitable Work tables	04 No.
	Stools	20 No.
	Discussion Table	01 No.
	Tool Cabinet	01 No.
	Trainees Locker with space for 20	01 No.
	First Aid Box	01 No.
	Book Shelf (glass panel)	01 No.
	Storage rack	01 No.

- Raw material, Testing chemicals and consumables are not included in the list.

ANNEXURE-II

GUIDELINES FOR INSTRUCTORS AND PAPER SETTERS

1. All questions of theory paper for the trade will be in objective type format.
2. Due care to be taken for proper & inclusive delivery among the batch. Some of the following method of delivery may be adopted:
 - a. Lecture
 - b. Lesson
 - c. Demonstration
 - d. Practice
 - e. Group discussion
 - f. Discussion with peer group
 - g. Project work
 - h. Industrial visit
3. Maximum utilization of latest form of training viz., audio visual aids, integration of IT, etc. May be adopted.
4. The total hours to be devoted against each topic may be decided with due diligence to safety & with prioritizing transfer of required skills.
5. Questions may be set based on following instructions:-

Sl. No.	Question on different aspect	Weightage in %age	Key Words may be like
1	Information received	25	What, Who, When
2	Knowledge	50	Define, Identify, Recall, State, Write, List & Name
3	Understanding	15	Describe, Distinguish, Explain, Interpret & Summarize
4	Application	10	Apply, Compare, Demonstrate, Examine, Solve & Use

6. Due weightage to be given to all the topics under the syllabus while setting the question paper.

13. LIST OF TRADE COMMITTEE MEMBERS

Sl. No.	Name & Designation Sh/Mr./Ms.	Organization	Mentor Council Designation
Members of Sector Mentor council			
1.	Dr D.C Sexana	Professor & HOD, Food Engineering and Tech. Dept, S.L.I.E.T, Longowal, Punjab	Chairman
2.	Dr S.L Shrivastava	Professor, IndiaN Institute of Technology, Kharagpur	Member
3.	Dr. Vikas Nanda	Associate Professor, Food Engineering and Tech. Dept, S.L.I.E.T, Longowal, Punjab	Member
4.	Dr Ashok Kumar	Professor Department of Process and Food Engineering, Punjab Agriculture University, Ludhiana, Punjab	Member
5.	Dr. D.S Sogi	Professor Department of Food Science and Technology, Guru Nanak Dev University, Amritsar, Punjab	Member
6.	Dr. Neeraj Kumar	Assistant Professor, National institute of food technology Entrepreneurship & Management, Kundli, Sonipat, Haryana	Member
7.	Rakesh Kumar	Principal, Govt. I.T.I, Hajipur, Bihar	Member
8.	M.A. Tejani	Gits Foods Products Pvt.Ltd, Pune	Member
9.	Er Parduman singh	Principal, Govt. I.T.I, Nabha, Punjab	Member
10.	Dr P.S Negi	Scientist, Central Food Technological, Research Institute, Mysore	Member
11.	Rizwana Ansari (T.O)	Govt. I.T.I, Chindwara, Madhya Pradesh	Member
12.	Priti Dwivedi (T.O)	Govt. I.T.I, Chindwara, Madhya Pradesh	Member
13.	Khurseed Jamal Siddique (TO)	Govt. I.T.I, Chindwara, Madhya Pradesh	Member
14.	Sandhya Singh (TO)	Govt. I.T.I, Chindwara, Madhya Pradesh	Member
15.	Ranjeeta Sharma	Principal, Maharashi Dayanand Institute of Tech. Jabalpur, M.P	Member
Mentor			
16.	J.P Meena (Director)	DGET HQ, New Delhi.	Mentor
Members of Core Group			
17.	K.L.Kulli (JDT)	CSTARI, Kolkata	Co-ordinator
18.	G.Mohan (ADT)	NIMI, Chennai.	Member
19.	Raminder Kumar (V.I)	R.V.T.I, Panipat	Team Leader
20.	Sriya Suman Patro	Lecturer, Government Polytechnic, Behrampur, Ganjam, Odisha	Member
Other industry representatives			

21.	Gagandeep Gupta	Quality Assurance Manager, International Fresh Farm Product India, Ltd,Channo, Sangrur,Punjab	Member
22.	Paramdeep Singh Ghuman	Moonak Distiller and Bottler pvt ltd, Moonak, Sangrur, Punjab	Member
23.	Vijay Singh	G.M, International Mega Food Park, Fazilka,Punjab	Member
24.	Ranveer Singh	Sr. Manufacturer Executive, I.T.C, Greater Noida, U.P	Member
25.	Rohit Verma	G.M, Jupiter multi-fruit processor Plot no 1, phase III, Industrial area Talliwal, District Una, H.P	Member
