PROCESSOR (MILK PRODUCT)

COMPETENCY BASED CURRICULUM

(Duration: 1Yr. and 03 months.)

APPRENTICESHIP TRAINING SCHEME (ATS)

NSQF LEVEL- 5

SECTOR – FOOD INDUSTRY

सत्यमेव जयते

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

PROCESSOR (MILK PRODUCT)

(Non-Engineering Trade)

(Designed in 2021)

APPRENTICESHIP TRAINING SCHEME (ATS)

NSQF LEVEL - 5

Developed By

Ministry of Skill Development and Entrepreneurship
Directorate General of Training
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1. BACKGROUND

1.1 Apprenticeship Training Scheme under Apprentice Act 1961

The Apprentices Act, 1961 was enacted with the objective of regulating the programme of training of apprentices in the industry by utilizing the facilities available therein for imparting on-the-job training. The Act makes it obligatory for employers in specified industries to engage apprentices in designated trades to impart Apprenticeship Training on the job in industry to school leavers and person having National Trade Certificate(ITI pass-outs) issued by Directorate General of Training (DGT) to develop skilled manpower for the industry**.** There are four categories of apprentices namely**; trade apprentice, graduate, technician and technician (vocational) apprentices. .**

Entry Qualifications and period of apprenticeship training of **trade apprentices** vary from trade to trade. The apprenticeship training for trade apprentices consists of basic training followed by practical training. At the end of the training, the apprentices are required to appear in a trade test conducted by DGT and those successful in the trade tests are awarded the National Apprenticeship Certificate (NAC) by DGT having worldwide recognition.

The period of apprenticeship training for graduate (engineers), technician (diploma) and technician (vocational) apprentices is one year. Certificates are awarded on completion of training by the Department of Education, Ministry of Human Resource Development.

1.2 Changes in Industrial Scenario

Recently we have seen huge changes in the Indian industry. The Indian Industry registered an impressive growth during the last decade and half. The number of industries in India have increased manifold in the last fifteen years especially in services and manufacturing sectors. It has been realized that India would become a prosperous and a modern state by raising skill levels, including by engaging a larger proportion of apprentices. It will ensure stronger collaboration between industry and the trainees which will augment supply of skilled workforce and enable development through employment. Various initiatives to build up an adequate infrastructure for rapid industrialization and improve the industrial scenario in India have been taken.

1.3 Reformation

The Apprentices Act, 1961 has been amended and brought into effect from 22nd December, 2014 to make it more responsive to industry and youth. Key amendments are as given below:

- Prescription of number of apprentices to be engaged at establishment level instead of trade-wise.
- Establishment can also engage apprentices in optional trades which are not designated, with the discretion of entry level qualification and syllabus.
- Scope has been extended also to non-engineering occupations.
- Establishments have been permitted to outsource basic training in an institute of their choice.
- The burden of compliance on industry has been reduced significantly through various schemes.

2. TRAINING SYSTEM

2.1 GENERAL

Directorate General of Training (DGT) under Ministry of Skill Development & Entrepreneurship offers range of vocational training courses catering to the need of different sectors of economy/ Labour market. The vocational training programmes are delivered under aegis of National Council of Vocational Training (NCVT). Craftsman Training Scheme (CTS) and Apprenticeship Training Scheme (ATS) are two pioneer programmes of NCVT for propagating vocational training.

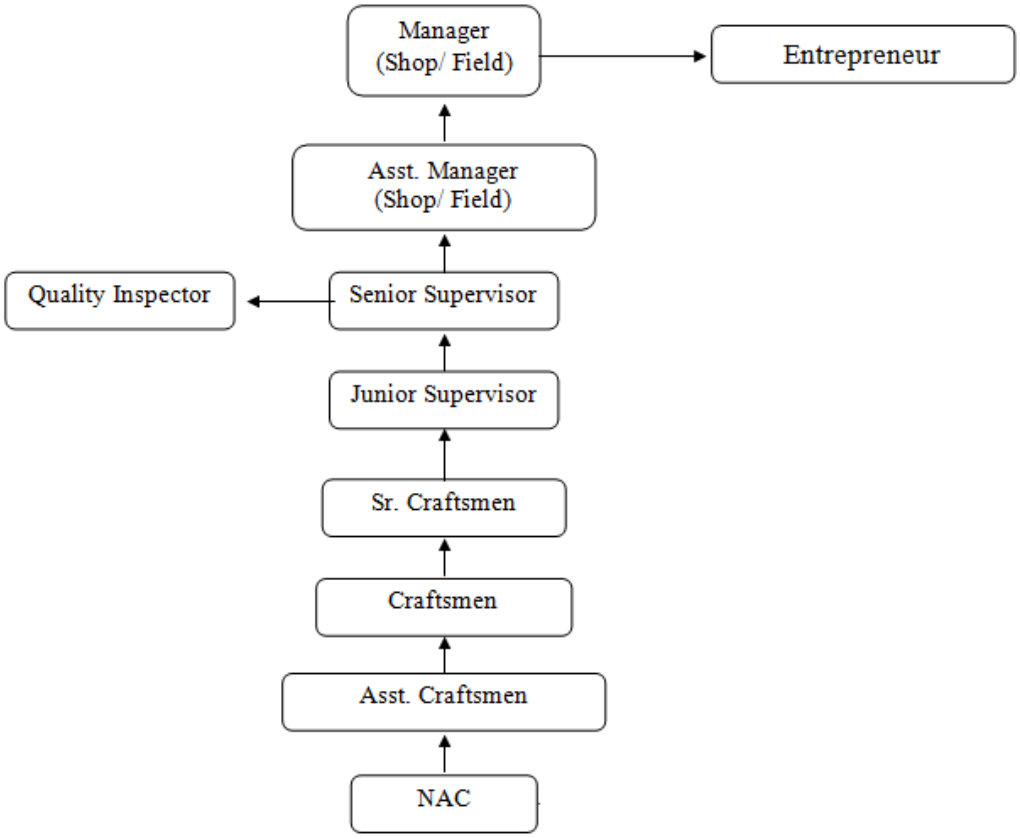
Processor (Milk Product) trade under ATS is delivered nationwide through different industries. The course is of one year and three months duration. It mainly consists of Domain area and Core area. In the Domain area Trade Theory & Practical impart professional - skills and knowledge, while Core area - Employability Skills imparts requisite core skills & knowledge and life skills. After passing out the training programme, the trainee is being awarded National Apprenticeship Certificate (NAC) by NCVT having worldwide recognition.

Broadly candidates need to demonstrate that they are able to:

- Read & interpret technical parameters/document, plan and organize work processes, identify necessary materials and tools;
- Perform task with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;
- Apply professional skill, knowledge, core skills & employability skills while performing jobs and solve problem during execution.
- Check the job/assembly as per drawing for functioning, identify and rectify errors in job/assembly.
- Document the technical parameters related to the task undertaken.

2.2 CAREER PROGRESSION PATHWAYS:

- Indicative pathways for vertical mobility.



2.3 COURSE STRUCTURE:

Table below depicts the distribution of training hours across various course elements during a period of one year and three months (*Basic Training and On-Job Training*): -

Total training duration details: -

Time (in months)	**1-3**	**4 - 15**
Basic Training	**BT – I**	**-----**
Practical Training (On - job training)	**----**	**OJT – I**

A. Basic Training

For 01 yr. 3 months Course (Non-Engg):- **Total 03 months:** 03 months in 1st yr.

Sl. No.	Course Element	Total Notional Training Hours (For 01 yr. Course)
1.	Professional Skill (Trade Practical)	270
2.	Professional Knowledge (Trade Theory)	120
3.	Employability Skills	110
	Total (including Internal Assessment)	**500**

B. On-Job Training:-

For 01 yr. 3 months Course (Non-Engg.): **Total 15 months**

Notional Training Hours for On-Job Training: 2080 Hrs.

C. Total training hours:-

Duration	Basic Training	On-Job Training	Total
For 01 yr. 3 months Course (Non-Engg.)	500 hrs.	2080 hrs.	2580 hrs.

2.4 ASSESSMENT & CERTIFICATION:

The trainee will be tested for his skill, knowledge and attitude during the period of course and at the end of the training programme as notified by Govt of India from time to time.

a) The **Internal assessment** during the period of training will be done by **Formative assessment method** by testing for assessment criteria listed against learning outcomes. The training institute have to maintain individual *trainee portfolio* as detailed in assessment guideline. The marks for formative assessment will be as per the template (Annexure – II).

b) The final assessment will be in the form of summative assessment method. The All India Trade Test for awarding NAC will be conducted by NCVT on completion of course as per guideline of Govt of India. The pattern and marking structure is being notified by Govt. of India from time to time. **The learning outcome and assessment criteria will be basis for setting question papers for final assessment. The examiner during final examination will also check** individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.

2.4.1 PASS REGULATION

The minimum pass percentage is 40% for each Theory Examination (except for Employability Skill it is 34%) and 60% marks for each Trade practical Examination. The candidate should pass in each subject conducted under All India Trade Test.

2.4.2 ASSESSMENT GUIDELINE

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 assessment. Due consideration should be given while assessing for teamwork, avoidance/reduction of scrap/wastage and disposal of scarp/wastage as per procedure, behavioral attitude, sensitivity to environment and regularity in training. The sensitivity towards OSHE and self-learning attitude are to be considered while assessing competency.

Assessment will be evidence based comprising the following:

- Job carried out in labs/workshop
- Record book/ daily diary
- Answer sheet of assessment
- Viva-voce
- Progress chart
- Attendance and punctuality
- Assignment
- Project work

Evidences of formativeassessments are to be preserved until forthcoming examination for audit and verification by examination body. The following marking pattern to be adopted while assessing:

Performance Level	Evidence
(a) Weightage in the range of 60 -75% to be allotted during assessment	
For performance in this grade, the candidate with occasional guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of an acceptable standard.	• Demonstration of good skill in the use of hand tools, machine tools and workshop equipment. • 60-70% accuracy achieved while undertaking different measurement with those demanded by the component / job / set standards. • A fairly good level of neatness and consistency in the measurement.

	• Occasional support in completing the project/work.
(b)Weightage in the range of above75% - 90% to be allotted during assessment	
For this grade, the candidate, with little guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of a reasonable standard.	• Good skill levels in the use of hand tools, machine tools and workshop equipment. • 70-80% accuracy achieved while undertaking different measurement with those demanded by the component/job/set standards. • A good level of neatness and consistency in the measurement. • Little support in completing the project/work.
(c) Weightage in the range of above 90% to be allotted during assessment	
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.	• High skill levels in the use of hand tools, machine tools and workshop equipment. • Above 80% accuracy achieved while undertaking different measurement with those demanded by the component / job / set standards. • A high level of neatness and consistency in the measurement. • Minimal or no support in completing the project.

3. JOB ROLE

Brief description of Job roles:

Dairy Worker, General: performs all or several tasks in reparation of various dairy products. Pasteurises raw milk or other dairy product to remove harmful bacteria. Develops bacterial culture for use in making butter, buttermilk, cheese and other products. Separates cream from milk and churns it into butter. Curdles milk and converts curds into cheese. May make icecream.

Separator Man: Cream Separator; Cream man (Dairy) operates milk separator to separate cream from milk. Assembles and adjusts separator as necessary, according to type of product for which separated cream or milk is to be used; places empty containers below cream and skimmed outlets; pours milk into separator; switches on centrifugal machine which automatically carries milk into bowl and separates milk into fat and skimmed milk; regulates separator to obtain required percentage of cream for making butter or ghee; cleans plant using hot water, soda and other detergent solutions. May also attend to pasteurizing plant.

Butter Maker: performs all or several tasks for making butter. Pasteurizes milk to eliminate harmful bacteria. Separates cream from milk in centrifuge. Adds lactic ferment to ripen cream. Pours or pumps cream into mechanical churn. Starts churn to make butter, controlling butter moisture, temperature and time of churning. May add salt to butter in churn. May take samples of butter for testing. May boil and strain butter to make 'ghee' and be designated as Ghee maker.

Cheese Maker: cooks milk and specified ingredients to make cheese according to formula. Pasteurizes and separates milk to obtain prescribed butter fat content; turns valves to fill vat with milk and heat milk to specified temperature; starts agitator to mix ingredients; tests samples of milk for acidity and allows agitator to mix ingredients until specified level of acidity is reached; dumps and mixes measured amount of rennet into milk; stops agitator to allow milk to coagulate into curd; cuts curd or separates curd with hand scoop to release whey (watery part); observes thermometer, adjusts steam valve, and starts agitator to stir and cook curd at prescribed temperature for specified time; squeezes and stretches sample of curd with figures and extends cooking time to achieve desired firmness or texture; scoops curd into burlap containers to drain off excess moisture; places cheese in moulds and presses it into shape. May salt cheese by immersing them in brine or roll cheese in dry salt, pierce or smear cheese with cultured wash to develop mould growth, and place or turn cheese blocks on shelves to cure cheese. May supervise ripening of cheese. May specialize in making particular type of cheese. May Pasteurise milk and operate centrifugal machine to separate cream out of pure milk.

Dairy Products Makers, Others: Dairy Workers (non-farm), Other include all other dairy workers not elsewhere classified, for example, those salting cheese by immersing them in brine or by rubbing them with dry salt, sterilizing milk; operating machines which homogenise milk, moulding butter or cheese into shape, packing and wrapping butter with paper, making condensed or powdered milk, etc. and may be designated according to nature of work performed.

Processor (Milk Product)

Reference NCO-2015:

(i) 7513-0100 – Dairy worker/ general
(ii) 7513-0200 - Separator man
(iii) 7513.0300 - Butter Maker
(iv) 7513.0400 - Cheese Maker
(v) 7513.9900 - Dairy Products Makers, Others

4. NSQF LEVEL COMPLIANCE

NSQF level for **Processor (Milk Product)** trade under ATS: **Level 5**

As per notification issued by Govt. of India dated- 27.12.2013 on National Skill Qualification Framework total 10 (Ten) Levels are defined.

Each level of the NSQF is associated with a set of descriptors made up of five outcome statements, which describe in general terms, the minimum knowledge, skills and attributes that a learner needs to acquire in order to be certified for that level.

Each level of the NSQF is described by a statement of learning outcomes in five domains, known as level descriptors. These five domains are:

a. Process
b. Professional Knowledge
c. Professional Skill
d. Core Skill and
e. Responsibility.

The Broad Learning outcome of Processor (Milk Product) trade under ATS mostly matches with the Level descriptor at Level- 5.

The NSQF level-5 descriptor is given below:

Level	Process Required	Professional Knowledge	Professional Skill	Core Skill	Responsibility
Level 5	Job that requires well developed skill, with clear choice of procedures in familiar context.	Knowledge of facts, principles, processes and general concepts, in a field of work or study.	A range of cognitive and practical skills required to accomplish tasks and solve problem by selecting and applying basic methods, tools, materials and information.	Desired mathematical skill, understanding of social, political and some skill of collecting and organizing information, communication.	Responsibility for own work and Learning and some responsibility for other's works and learning.

5. GENERAL INFORMATION

Name of the Trade	Processor (Milk Product)
NCO - 2015	7513-0100, 7513-0200, 7513.0300, 7513.0400, 7513.9900
NSQF Level	Level – 5
Duration of Apprenticeship Training (Basic Training + On-Job Training)	One year +3 months
Duration of Basic Training	**3 months**
Duration of On-Job Training	**12 months**
Entry Qualification	ITI passed on CTS 'Milk & Milk Product Technician' or Passed 12th class examination in Science.
Space Norms (BTP Workshop)	56 Sq. m
Power Norms (BTP Workshop)	4 KW
Selection of Apprenticeship	The apprentices will be selected as per Apprenticeship Act amended time to time.
Instructors Qualification for Basic Training	B.Voc/Degree in Dairy Technology from UGC recognized university with one year experience in the relevant field. **OR** Diploma (Minimum 2 years) in Dairy Technology from a recognized board of education or relevant Advanced Diploma (Vocational) from DGT with two-year experience in the relevant field. **OR** NTC/NAC passed in the trade of "Milk & Milk Product Technician" with three-year experience in the relevant field. **Desirable Qualification:** Relevant National Craft Instructor Certificate (NCIC) in any of the variants under DGT.
Infrastructure for basic training	As detailed in Annexure - I

Examination	The internal examination/ assessment will be held on completion of each year. Final examination for all subjects will be held at the end of course and same will be conducted by DGT.
Rebate to Ex-ITI Trainees	3 months
CTS trades eligible for Processor (Milk Product) Apprenticeship	Milk & Milk Product Technician

Note:

- *Industry may impart training as per above time schedule for different OJT, however this is not fixed. The industry may adjust the duration of training considering the fact that all the components under the syllabus must be covered. However, the flexibility should be given keeping in view that no safety aspects are compromised.*
- *For imparting Basic Training, the industry to tie-up with ITIs having such specific trade and affiliated to DGT.*

6. LEARNING OUTCOME

6.1 GENERIC LEARNING OUTCOME

The following are minimum broad Common Occupational Skills/ Generic Learning Outcome after completion of the Processor (Milk Product) course of 15 Months duration under ATS.

Block I: -

1. Recognize & comply safe working practices, environment regulation and housekeeping.
2. Select and ascertain measuring instrument and measure dimension of components and record data.
3. Explain the concept in productivity, 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 personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.
6. Plan and organize the work related to the occupation.

6.2 SPECIFIC LEARNING OUTCOME

1. Comply with hygiene and cleanliness of floor dairy equipment following safety precautions.
2. Identify the material and handle the equipment used in the cleaning and maintenance of the work area.
3. Operate different dairy machineries used in dairy plant and identify the basic milk product market.
4. Perform sterilization of milk container and carry out maintenance of milk processing machineries.
5. Plan and process sampling of milk & milk products and raw materials used in milk processing industries.
6. Perform various methods of testing conducted on milk using required equipment.
7. Demonstrate Pasteurization process, homogenization, standardization, reconstitution and recombination of milk.
8. Perform preparation of dried milk making and apply the required amount of air pressure for pasteurisation, homogenisation, standardization, reconstitution and recombination.
9. Demonstrate the use of refrigerant and maintenance of refrigeration units used in mil processing industries.
10. Perform preparation of various milk products like butter, cheese, milk powder, ice-cream, chocolates etc
11. Analyze the quality of the finished product and apply the milk safety rules as per standard norms.

Note: *Learning outcomes are reflection of total competencies of a trainee and assessment will be carried out as per assessment criteria.*

7. LEARNING OUTCOME WITH ASSESSMENT CRITERIA

GENERIC LEARNING OUTCOME	
LEARNING 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.
	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/unsalvageable 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 Productive 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 avoidance of same.
	1.13 Take opportunities to use energy and materials in an environmentally friendly manner
	1.14 Avoid waste and dispose waste as per procedure
	1.15 Recognize different components of 5S and apply the same in the working environment.
2. Select and ascertain measuring instrument and measure dimension of components and record data.	2.1 Select appropriate measuring instruments (as per tool list).
	2.2 Ascertain the functionality & correctness of the instrument.
	2.3 Measure dimension of the components & record data to analyse the with given drawing/measurement.

3. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.	3.1 Explain the concept of productivity and quality tools and apply during execution of job.
	3.2 Understand the basic concept of labour welfare legislation and adhere to responsibilities and remain sensitive towards such laws.
	3.3 Knows benefits guaranteed under various acts
4. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.	4.1 Explain the concept of energy conservation, global warming, pollution and utilize the available recourses optimally & remain sensitive to avoid environment pollution.
	4.2 Dispose waste following standard procedure.
5. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	5.1 Explain personnel finance and entrepreneurship.
	5.2 Explain role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes & procedure & the available scheme.
	5.3 Prepare Project report to become an entrepreneur for submission to financial institutions.
6. Plan and organize the work related to the occupation.	6.1 Use documents, drawings and recognize hazards in the work site.
	6.2 Plan workplace/ assembly location with due consideration to operational stipulation
	6.3 Communicate effectively with others and plan project tasks
	6.4 Assign roles and responsibilities of the co-trainees for execution of the task effectively and monitor the same.
SPECIFIC OUTCOME	
<u>Block-I</u>	
*Assessment Criteria i.e. the standard of performance, for each specific learning outcome mentioned under **block – I** (section: 10) must ensure that the trainee achieves well developed skill with clear choice of procedure in familiar context. Assessment criteria should broadly cover the aspect of **Planning** (Identify, ascertain, estimate etc.); **Execution** (perform, illustration, demonstration etc. by applying 1) a range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information 2) Knowledge of facts, principles, processes, and general concepts, in a field of work or study 3)Desired Mathematical Skills and some skill of collecting and organizing information, communication) and **Checking/ Testing** to ensure functionality during the assessment of each outcome. The assessments parameters must also ascertain that the candidate is responsible for own work and learning and some responsibility for other's work and learning.*	

8. SYLLABUS

BASIC TRAINING (Block – I) **Duration: Three Months**		
Week No.	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
1	Familiarization with dairy industry, importance of trade training machinery used in the trade, type of work done by trainees in the dairy, type of jobs made by the trainees in the trade. Introduction to safety including firefighting equipment & their uses etc.	Importance of safety and general precautions observed in the industry. Importance of the trade in the development of industrial economy of country recreational and medical facilities and other extracurricular activities of the institute.
2	Importance to the cleanliness and hygiene with specific reference to milk and milk products. Clean and maintain the cleanliness of the work area using approved sanitizers and keep it free from dust, waste, flies and pests. Ensure that the work area is safe and hygienic for milk processing. Dispose waste materials as per organization standards and industry requirements.	Importance to the cleanliness and hygiene, precautions observed in the institute and in the section. Selection and use of dairy cleaners and sanitizers. Cleaning in place system (CIP), Various chemical used for CIP of dairy plant.
2	Select and set the machines and tools required Carry out automatic methods of can washing. Carry out manual methods of can washing. Maintenance of crate-washer.	Introduction to automatic methods of can washing. Introduction to manual methods of can washing. Factors affecting washing operation. General overview and knowhow of utility section of dairy like refrigeration plant, air compressor units, ETP, Boiler and maintenance section. Introduction to different dairy products useful for marketing.
3	Milk sampling. Ingredients of milk. Sampling of milk and milk products. Perform physical examination of milk. Perform platform tests of milk like organoleptic tests, clot on boiling test, alcohol test and acidity test.	What is milk sampling, density of milk etc. Method of Sampling of raw milk. Plat form test. Quality of raw milk. Different products made from the milk. Principle and methods used for milk

		processing. General knowhow for microbiology of milk and milk products.
4	Use of testing equipments for milk, functions of Lactometer and other instruments. Estimate specific gravity of milk by lactometer. Estimate fat by Gerber method and Milk scan. Estimation of SNF content in milk. Detection of various adulterants in milk. Ascertain microbiological quality of milk by MBRT and SPC and Qualiform.	Introduction to testing equipments for milk. Introduction to testing equipments to estimate fat percentage, protein percentage and lactose percentage.
5	Carry out Pasteurization process, homogenization, standardization, reconstitution and recombination of milk.	What is pasteurization process, types of heating systems in pasteurization (H.T.S.T), operation of pasteurizers, cleaning & maintenance of the pasteurizers. Pasteurization — minimum pasteurization standards - heating milk to 63ºC (143ºF) for 30 minutes. Killing of pathogenic bacteria, importance of sterilization of milk.
6	Set air pressure required for pasteurization, homogenization, standardization, reconstitution and recombination. Set the homogenizer for required fat level in milk, and open valves to pass milk through homogenizer to produce standardized milk.	Uses of air pressure in instrumentation and equipments. Principle of homogenization. Application of homogenization in dairy industry. Drying Theories, production by drum drying and air spray system; defects; dried milk products–butter-milk powder. Drying Equipment: Spray Drier, Bag filter unit, Hepa filter and evaporation plant.
7-8	Use of cold stores. Set process parameters of the chilling tank like temperature, time etc. Circulate refrigerant and pre-cooled water through coils to cool milk. Make minor adjustments or repairs.	Process of milk condensing, process of drying milk condensing equipments, drying equipments.
	Use of refrigeration units and related equipments. Turn valve to circulate refrigerant	Use of refrigeration in dairy industry. Freezing method and equipment used.

	through coils of the chilling tank to cool milk until packing. Circulate milk through coils/jacket of the cream holding tank to keep the cream chill.	
9-11	Check the availability of raw materials, packaging materials, equipment Processing liquid milk into other products like butter, cheese, milk powder, ice-cream, chocolates etc. Pump or add weighed quantity of ingredients into milk, set and maintain process parameters like temperature in the machine to produce dairy products like toned milk, flavoured milk, curd, paneer, ice-cream etc following sop. Practical work on milk products handling and ancillary operations connected thereto.	Different products made from the milk. Various processes of milk conversion into products. Composition, production and defects butter, cheese, milk powder, ice-cream, chocolates etc Theories of churning, grading and prevention of defects. Quality of butter. Composition, types of cheese, production of cottage and cheddar cheeses; defects. To study the effect of temperature on the rate of cream separation under the influence of gravity. Introduction to different dairy products useful for marketing. Principle and methods used for milk processing.
12	Follow industry standards like GMP and HACCP and product recall process. Application of HACCP and GMP, GHP in a milk processing plant.	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 milk processing industry.
13	**Assessment/ Examination 03days**	

Note: - *More emphasis to be given on video/real-life pictures during theoretical classes. Some real-life pictures/videos of related industry operations may be shown to the trainees to give a feel of Industry and their future assignment.*

9. SYLLABUS - CORE SKILLS

9.1 EMPLOYABILITY SKILLS

(DURATION: - 110 HRS.)

BASIC TRAINING	
1. English Literacy	Duration : 20 Hrs. Marks : 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	Duration : 20 Hrs. Marks : 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	Basic of computer Networks (using real life examples), Definitions of

and Internet	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	Duration : 15 Hrs. Marks : 07
Introduction to Communication Skills	Communication and its importance Principles of Effective communication Types of communication - verbal, non verbal, written, email, talking on phone. Non verbal 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 Attitude
4. Entrepreneurship Skills	Duration : 15 Hrs. Marks : 06

Concept of Entrepreneurship	Entrepreneur - Entrepreneurship - Enterprises:-Conceptual issue Entrepreneurship vs. management, Entrepreneurial motivation. Performance & Record, Role & Function of entrepreneurs in relation to the enterprise & relation to the economy, Source of business ideas, Entrepreneurial opportunities, The process of setting up a business.
Project Preparation & Marketing analysis	Qualities of a good Entrepreneur, SWOT and Risk Analysis. Concept & application of PLC, Sales & distribution Management. Different (Difference) Between Small Scale & Large Scale Business, Market Survey, Method of marketing, Publicity and advertisement, Marketing Mix.
Institutions Support	Preparation of Project. Role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes & procedure & the available scheme.
Investment Procurement	Project formation, Feasibility, Legal formalities i.e., Shop Act, Estimation & Costing, Investment procedure - Loan procurement - Banking Processes.
5. Productivity	Duration : 10 Hrs. Marks : 05
Benefits	Personal / Workman - Incentive, Production linked Bonus, Improvement in living standard.
Affecting Factors	Skills, Working Aids, Automation, Environment, Motivation - How (to) 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 and Environment Education	Duration : 15 Hrs. Marks : 06
Safety & Health	Introduction to Occupational Safety and Health importance of safety and health at workplace.
Occupational Hazards	Basic Hazards, Chemical Hazards, Vibroacoustic Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/ Disorders & its prevention.
Accident & safety	Basic principles for protective equipment. 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 provision legislation of India. Safety, health, welfare under legislative of India.
Ecosystem	Introduction to Environment. Relationship between Society and Environment, Ecosystem and Factors causing imbalance.
Pollution	Pollution and pollutants including liquid, gaseous, solid and hazardous waste.
Energy Conservation	Conservation of Energy, re-use and recycle.
Global warming	Global warming, climate change and Ozone layer depletion.
Ground Water	Hydrological cycle, ground and surface water, Conservation and Harvesting of water.
Environment	Right attitude towards environment, Maintenance of in -house environment.
7. Labour Welfare Legislation	Duration : 05 Hrs. Marks : 03
Welfare Acts	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	Duration : 10 Hrs. Marks : 05
Quality Consciousness	Meaning of quality, Quality characteristic.
Quality Circles	Definition, Advantage of small group activity, objectives of quality Circle, Roles and function of Quality Circles in Organization, Operation of Quality circle. Approaches to starting Quality Circles, Steps for continuation of Quality Circles.
Quality Management System	Idea of ISO 9000 and BIS systems and its importance in maintaining qualities.
House Keeping	Purpose of House-keeping, Practice of good Housekeeping.
Quality Tools	Basic quality tools with a few examples.

10. DETAILS OF COMPETENCIES (ON-JOB TRAINING)

The **competencies/ specific outcomes** on completion of On-Job Training are detailed below: -

OJT - 1

1. Comply with hygiene and cleanliness of floor dairy equipment following safety precautions.
2. Identify the material and handle the equipment used in the cleaning and maintenance of the work area.
3. Operate different dairy machineries used in dairy plant and identify the basic milk product market.
4. Perform sterilization of milk container and carry out maintenance of milk processing machineries.
5. Plan and process sampling of milk & milk products and raw materials used in milk processing industries.
6. Perform various methods of testing conducted on milk using required equipment.
7. Demonstrate Pasteurization process, homogenization, standardization, reconstitution and recombination of milk.
8. Perform preparation of dried milk making and apply the required amount of air pressure for pasteurisation, homogenisation, standardization, reconstitution and recombination.
9. Demonstrate the use of refrigerant and maintenance of refrigeration units used in mil processing industries.
10. Perform preparation of various milk products like butter, cheese, milk powder, ice-cream, chocolates etc
11. Analyze the quality of the finished product and apply the milk safety rules as per standard norms.

Note:

1. Industry must ensure that above mentioned competencies are achieved by the trainees During their on-job training.
2. In addition to above competencies/ outcomes industry may impart additional training Relevant to the specific industry

ANNEXURE – I

List of Trade Tools & Equipment for Basic Training			
Processor (Milk Product) (For 20 Apprentices)			
Sl. No.	**Name of the items**	**Specification**	**Quantity (indicative)**
A. Furniture			
	Class Room		
1.	Instructor Chair & Table	Branded ,ISO certified	01 No
2.	Dual Desk	Branded ,ISO certified	10 No.
	Workshop/Lab		
3.	Suitable Work tables	Branded ,ISO certified	04 No.
4.	Stools	Branded ,ISO certified	20 No.
5.	Discussion Table	Branded ,ISO certified	02 No.
6.	Tool Cabinet	Branded ,ISO certified	01 No.
7.	Trainees Locker with space for 20	Branded ,ISO certified	01 No.
8.	First Aid Box	All Necessary first aid medicines	01 No.
9.	Book Shelf (glass panel)	Branded ,ISO certified	01 No.
10.	Storage rack	Branded ,ISO certified	01 No.
B: Latest Edition of Tools:			
11.	Mini dairy plant	Complete Mini-processing unit for milk	1 no.
12.	Milk Chiller for chilling milk	Up to a temperature of about – 10 °C	1 no.
13.	Milk cans	Different size	As required
14.	Cheese vat	Made of heavy Stainless steel (306), size approx. 4'X 2.5'X 1' with proper outlet and taps	1 no.
15.	Cream separator	Motor operated, Centrifugal, capacity up to 1-2 Kg/ cream per min	1 no.
16.	Weight balances	Digital	1 no.
17.	Plate pasteurizer	(Lab model)	1

18.	Butter churner	(Lab model)	1
19.	Boiler	(Lab scale capacity of steam as per the equipments)	1
20.	Deep fridge	(Lab model)	1
21.	Steam jacketed kettle with surface scrapper	50 liter Capacity	1
22.	Mawa machine	(Lab model)	1
23.	Crown corking machine	Hand operator	1
24.	Form fill seal machine	(Lab model)	1
25.	Ice cream plant	(Lab model)	1
26.	Centrifuge machine	For Fat estimation in milk,	1
27.	Gerber tubes	for fat estimation	As required
28.	Desicator	Different size	As required
29.	Weight balances Digital	(min 10 gm to max 5 kg)	1
30.	Vacuum pan	(Lab model)	1
31.	Vernier caliper	15 cm. 0.01 mm LC	2
32.	Screw Gauge	Micrometer, 0.001 mm LC,10 cm cap	4
33.	Steel scale	12 " standard steel	2
34.	Steel Measuring tape	Scales 1 meter, and of 50 ft	2
35.	Weight balances Digital	(min 0.01gm to max 1kg)	1
36.	Sinks	standard size	1
37.	Hot plate	Electrical 2 KW	1
38.	Spray drier	(Lab Scale)	1
39.	Heat sealing machine	Hand / pedal operated	1
40.	Tanks SS	50 litres capacity, cylindrical with cap	1
41.	Syrup tanks	50, 100 lit capacity SS	1
42.	Pressure cooker	5 Kg and 10 Kg SS	1
43.	Liquid filling machine	For filling liquid in bottles, 200 ml, 500 ml, 1000 ml. Manual	As required
44.	SS filter	Sieve type cloth filter, hydraulic,	1
45.	Bottle opener	Heavy duty, Stainless Steel	1

46.	Burette with stand	50 ml ordinary glass	1
47.	Pipette	5-50 ml capacities, glass	As required
48.	Lab glassware's	Different sizes and types	As required
49.	Working tables	Stainless Steel Size 6' X 3'	1
50.	Improved stoves	Made of MS with proper safety Measures, Valves etc	1
51.	Stainless steel / Aluminum pots	Different Capacities	As required
52.	Muffle Furnace	(Lab Scale)	1
53.	Test Tubes		As required
54.	Glass Beakers		As required
55.	Petri Dishes		As required
56.	Lactometer		As required
57.	Pipette : 5-50 ml capacities, glass		As required
58.	Lab glassware's : Different sizes and types		As required

Raw material, testing chemicals and consumables are not included in the list. All Machines made up of stainless steel, ISO certified, Branded.

Processor (Milk Product)

TOOLS & EQUIPMENT'S FOR EMPLOYABILITY SKILLS		
Sl. No.	**Name of the items**	**Quantity**
1.	Computer (PC) with latest configurations and Internet connection with standard operating system and standard word processor and worksheet software.	10 Nos.
2.	UPS - 500VA	10 Nos.
3.	Scanner cum Printer	1 No.
4.	Computer Tables	10 Nos.
5.	Computer Chairs	20 Nos.
6.	LCD Projector	1 No.
7.	White Board 1200mm x 900mm	1 No.
Note: - Above Tools &equipment not required, if Computer LAB is available in the institute.		

ANNEXURE-II

FORMATIVE ASSESSMENT

Name & Address of the Assessor:			**Year of Enrollment:**
Name & Address of BTP/Establishment (Govt./Pvt.) :			**Date of Assessment :**
Name & Address of the Industry :			**Assessment location: Industry / ITI**
Trade Name :	**Examination:**		**Duration of the Trade/course:**
Learning Outcome:			

Sl. No	**Candidate Name**	**Father's/Mother's Name**	Safety consciousness	Workplace hygiene	Attendance/ Punctuality	Ability to follow Manuals/ Written instructions	Application of Knowledge	Skills to handle tools & equipment	Economical use of materials	Speed in doing work	Quality in workmanship	VIVA	**Total formative assessment Marks**	**Result (Y/N)**
Maximum Marks (Total 100 Marks)			**15**	**5**	**10**	**5**	**10**	**10**	**5**	**10**	**15**	**15**		
1														
2														