



COMPETENCY-BASED CURRICULUM

FOR THE TRADE OF

AGRO PROCESSING

UNDER

CRAFTSMAN TRAINING SCHEME (CTS)

IN SEMESTER PATTERN

Government of India
Ministry of Skill Development and 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 (RVTIs) 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	Agro Processing
2	N.C.O./NOS Code No.	7414.90
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: Agro Processing

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 Agro Processing industry.
- Supervisor in Agro Processing Industry.
- Packaging Supervisor in Agro Processing industry.
- Skilled Worker in Food MNC.
- Entrepreneur in Agro processing.

4.2 NOS & QP/NCO Mapping:

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5. NSQF LEVEL COMPLIANCE

The Broad Learning outcomes of Agro Processing 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 Agro Processing course of one 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. Operate agro machinery; hammer mill, ground nut decorticator hand operated, mini dal mill, mini rice mill, mini oil expeller, grain cleaner, mini grain mill, wheat flour mill, micro pulveriser, destoner, packaging machine (heat sealing machine), weighing balance, and extruder.
2. Explain structures and suitable storage conditions for cereal grains.
3. Explain structures and suitable storage conditions for cereal grains.
4. Explain composition and structure of different cereals and pulses.
5. Practice and explain various pre-processing activities in cereal grains prepare products.
6. Prepare products from different pulses.
7. Check the quality parameters for raw materials & finished products
8. Explain packaging processes and materials for finished products from cereals and pulses.

SEMESTER – II

1. Demonstrate the knowledge of general safety of machinery and practice first aid & treatment.
2. Prepare and demonstrate spice grinding and packaging.
3. Demonstrate and explain processing of paddy for rice milling.
4. Demonstrate and explain oil extraction.
5. Prepare soya products (soya milk, soya flour, soya paneer (tofu).
6. Packaging, sealing and test the quality of prepared products with market survey.
7. Apply HACCP GMP for all agro products and processing of the waste for byproducts.

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

	<p>according to site policy.</p> <p>1.9 Identify Personal Productive Equipment (PPE) and use the same as per related working environment.</p> <p>1.10 Identify basic first aid and use them under different circumstances.</p> <p>1.11 Identify different fire extinguisher and use the same as per requirement.</p> <p>1.12 Identify environmental pollution & contribute to the avoidance 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	<p>5.1 Semester examination to test knowledge on entrepreneurship.</p>

manage/organize related task in day to day work for personal & societal growth.	5.2 It's applications will also be assessed during execution of assessable outcome.
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.	6.1 Semester examination to test knowledge on basic computer working, basic operating system and uses internet services. 6.2 Their applications will also be assessed during execution of assessable outcome.

Semester-I

Assessable outcome	Assessment criteria
Operate agro machinery ; hammer mill, mini rice mill, ground nut decorticator hand operated, grain cleaner, mini oil expeller, grain cleaner, wheat flour mill, micro pulveriser, mini dal mill, destoner, packing machine(heat sealing machine), weighing balance, extruder.	1.1 Describe the safety measures before operating machinery.
	1.2 Demonstrate the working principles for all machinery.
	1.3 Identify the basic faults and remove the problems.
	1.4 Evaluate the capacity of different agro processing machines.
Explain composition and structure for different cereals and pulses	2.1 Identify cereals (wheat, rice, corn, barley, sorghum, and oats).
	2.2 Identify pulse (green gram, black gram, horse gram, pigeon pea, and lentil).
	2.3 Demonstrate the knowledge of composition, nutritional value and structure of cereals and pulses.
Explain structure and suitable storage conditions for cereal grains	3.1 Identify different types of storage structures for different cereal grains (cover, grain bins, warehouses & silos).
	3.2 Enlist the specifications for storage structures.
Practice and explain various pre processing activities in cereal grains and prepare products	4.1 Describe the pre processing methods (cleaning, grading).
	4.2 Prepare whole wheat flour, maida, dalia, suji.

	4.3 Prepare cereal based products like macaroni, noodles, spaghetti and vermicelli.
	4.4 Determine the starch content.
Prepare products from different pulses	5.1 Describe the pre treatment in dal milling like cleaning, grading, soaking and drying.
	5.2 Prepare dal by pulse milling. e.g. pigeon pea, green gram, Bengal gram.
	5.3 Prepare whole pulses for packing. like Bengal gram, black gram, green gram and ground nut.
	5.4 Demonstrate and explain packing machines and equipments used for packing of finished products.
Check the quality parameters for raw materials and finished products	6.1 Determination of moisture content of flour from cereals and pulses.
	6.2 Determination of starch content in different cereal grains.
	6.3 Check the adulteration in pulses.
Explain packaging methods and materials used for different cereals and pulses	7.1 Identify different packaging materials.
	7.2 Describe the packing and labeling methods in agro industry.

Semester-II

Assessable outcome		Assessment criteria
8	Demonstrate the knowledge of general safety of machinery and practice first aid treatment and hygienic and sanitary conditions as per HACCP and GMP.	1.1 Describe the general safety precautions and handling of equipments to prevent accidents.
		1.2 Identify the safety equipments.
		1.3 Describe the knowledge about HACCP and GMP.
9	Prepare and demonstrate spice grinding	2.1 Identify and procure the raw materials for spice grinding like coriander, black pepper, red chili, and turmeric.
		2.2 Describe the preprocessing of spices, cleaning, grading, destoning.
		2.3 Demonstrate the working principle for the production of spice powders.
		2.4 describe the method of packing of whole spice for marketing like black pepper.
10	Demonstrate and	3.1 Describe paddy processing in lab.

	explain processing of paddy for rice milling	3.2 Demonstrate the parboiling process for rice milling. 3.3 Demonstrate and explain the packing of rice, weighing, bagging, sealing machine.
11	Demonstrate and explain oil extraction	4.1 Demonstrate the knowledge of working for oil expellers. 4.2 Explain the different methods for oil extraction from different oil seeds like mustard, ground nut. 4.3 Describe various processing steps involved in oil extraction like filtration, refining, purification, deodorization, stabilization, and hydrogenation.
12	Prepare soya products(soya flour, soya paneer (tofu))	5.1 Prepare soya products. 5.2 Describe the processing methods of soya flour, soya paneer (tofu), soya milk.
13	Packaging, sealing and testing the quality of prepared products with market survey	6.1 Identify the packaging material for suitable storage conditions. 6.2 Describe the packing methods.
14	Explain the food regulations	7.1 Explain and follow food safety standards act, 2006 BIS, ISO-22000, Agmark, HACCP, and International Food Standards GMP. 7.2 Use of agro industry waste.

9. SYLLABUS CONTENT WITH TIME STRUCTURE

SYLLABUS FOR THE TRADE OF AGRO PROCESSING

9.1 Syllabus Content for Professional Skill & Knowledge

First Semester

Duration: Six Months

Detailed Syllabus:

AGRO PROCESSING		
SYLLABUS: FIRST SEMESTER		
Weeks	Practical	Theory
1-3	<p>Conducting survey of the different agro products from the market.</p> <p>Functional and structural designs of grain storage structure such as cover, grain bins, warehouses and silos.</p> <p>BIS specification for storage structures and design</p>	<p>Agro processing industry</p> <p>Introduction and scope of agro processing industries in India.</p> <p>Status, Production and utilization of cereals and pulses in India and the world.</p> <p>Factor s affecting quality of food grains.</p> <p>Scope of agro processed products for entrepreneurship.</p>
4-6	<p>Structure of important cereals (Wheat, rice, corn, barley, sorghum, oats).</p> <p>Structure of important Pluses (Green gram, horse gram, pigeon pea, lentil, black gram).</p>	<p>Structure and composition:</p> <p>The chemical compositions and nutritional values of cereal, pulses and oil seeds.</p> <p>Importance of cereal, pulses and oil seeds in diet.</p> <p>Distribution of vitamins, protein, minerals, carbohydrates and fats in different grains and their relevance to milling.</p>
7-11	<p>Working with agro processing machinery :</p> <p>Hammer mill, Groundnut decorticator hand operated,</p> <p>Mini dal mill, Mini rice mill, Mini oil expeller, Grain cleaner, Mini grain mill, Wheat flour mill, Micro pulveriser and</p>	<p>Machinery in Agro processing</p> <p>Different machines used in agro processing industry; working principles operation and maintenance.</p> <p>Cost and capacity of machines in agro processing industry.</p>

	<p>Destoner, Packaging machine (Heat sealing machine), Weighing Balance, Extruder.</p> <p>Handling and practice on the equipment</p> <p>Fault identification and removal of faults</p> <p>Capacity evaluation of different agro processing machines.</p>	<p>Maintenance of equipment, Safety.</p>
12-14	<p>Cleaning, grading and other pre-processing activities.</p> <p>Production of whole wheat flour.</p> <p>Production of Suji, Maida, Dalia.</p> <p>Packaging and labelling of the products.</p> <p>Determination of starch content from wheat flour.</p>	<p>Cereal grains, wheat</p> <p>Different grains suitable for agro processing</p> <p>Primary processing of wheat.</p> <p>Methods of Cleaning, grading, milling.</p> <p>Standards for the wheat flour.</p> <p>Production of different wheat product.</p> <p>Adulteration in flour.</p>
15-17	<p>Pre-treatment in dal milling like cleaning, grading, soaking, and drying. Milling pulses for production of dal, e.g. pigeon pea, green gram, Bengal gram.</p> <p>Packaging and uses of wastes from dal mill.</p>	<p>Dal (Pulse) Milling</p> <p>Pre milling treatments of pulses, pulse milling and recent developments.</p> <p>Principle of dal milling.</p> <p>Pulses suitable for milling.</p> <p>Different Methods of dal milling</p> <p>Working and principle of dal mill.</p> <p>Pre-treatment in dal milling</p> <p>Waste utilization.</p> <p>Adulteration in pulse.</p>
18-19	<p>Production of packed whole pulse like Bengal gram, black gram, green gram, groundnut.</p> <p>Study of packaging equipment and machinery used for packing of agro processed products.</p>	<p>Packaged whole pulse :</p> <p>Suitability of whole pulse for marketing.</p> <p>Production of packed whole grains.</p> <p>Packaging, labelling, storage and marketing of whole grains.</p> <p>Study the various type of packaging materials used in agro processing industry.</p>

20-22	<p>Production of cereal based products like macaroni, noodles, spaghetti and vermicelli.</p> <p>Estimation of moisture content in cereals flour.</p> <p>Determination of different quality parameters in cereals and pulses product.</p>	<p>Cereals and pulses industry</p> <p>By-Products :</p> <p>Recovery and utilization of starch, gluten, dextrin, dextrose, bran, bran oil, Germ and germ oil, husk, hulls of pulses, soybean meal and hulls, protein isolates, high fructose corn syrup, corn liquor, yellow and white dextrin and dextrose powder.</p>
23-25	Industrial Training in Agro processing industry	
26	Revision/Examination	

Second Semester

Duration: Six Months

Detailed Syllabus:

AGRO PROCESSING		
SYLLABUS: SECOND SEMESTER		
Weeks	Theory	Practical
1-2	<p>Varietal effects on processing of cereals and pulses.</p> <p>Introduction to operation Green revolution.</p> <p>Knowledge of importance on Agro Industries Product in food Industry & its market value.</p> <p>Introduction of agro processing industry.</p> <p>Scope of agro processed products for entrepreneurship.</p> <p>Knowledge about the sources of accidents.</p> <p>Known the necessary safety & precautions taken in each machines.</p> <p>Known to prevention overcome from accidents.</p>	<p>Necessity of housekeeping.</p> <p>Maintaining general safety.</p> <p>First aid practice & treatment.</p> <p>Safety precautions taken & use safety equipments including fire fighting equipments.</p> <p>Familiarization of organization & their Agro Industries products unit.</p> <p>Handling of tools, equipments, & machineries in the section & proper utilization & upkeep.</p> <p>Indenting & procurement of tools and materials from store as need.</p> <p>Conducting survey of the different agro products from the market</p>
3-5	<p>Spice Grinding</p> <p>Production of major spices in India & their importance in Indian diet.</p> <p>Spices suitable for processing.</p> <p>Unit operations in spices processing: Principles, method and machinery in spice grinding.</p> <p>Quality assurance & methods to detect adulteration.</p>	<p>Procurement and Pre- processing of spices, cleaning, grading, destoning working with machinery for spice grinding.</p> <p>Production of spice powders from, coriander, black pepper, red chilly, turmeric</p> <p>Packaging of whole spice for marketing.</p>

6-9	<p>Oil Extraction : Importance and functions of oils in food and health. Different methods of oil extractions, oil expression from oilseeds like mustard/rapeseed, coconut, sunflower, groundnut, sesame and cotton. Different types of oil expellers. Oilseeds, properties and suitability. Process flow chart of oil extractions. Filtration and packaging. Oil refining and purification : Refining, purification, deodorization, stabilization and hydrogenation.</p>	<p>Working of oil expellers Oil expelling from different oil seeds e.g. mustard, groundnut, and rapeseed, sunflower. Filtration and packaging of oil.</p> <p>Different quality parameters : Peroxide value, saponification value, Iodine value, acid value, TBA , RM value, P- value, Kries value, Detect the adulteration in oils</p>
10-12	<p>Rice Milling Discuss the working and principle of rice mill in detail and their parts. Properties of paddy for rice milling Process of modern rice milling Working principle and operation. Cleaner, Sheller, separator, polisher and graders etc. Nutritional loss in polished rice. Rubber roller. Parboiling of rice: Theory & methods of Parboiling. Advantages and limitations of parboiling of rice.</p>	<p>Processing of paddy for rice in lab. Practical demonstration on rice milling process in Rice mill. Packaging of rice: Weighing, bagging, Sealing machines.</p>
13-15	<p>Soya Products Details of soya product Processing methods of soya milk, soya paneer (tofu), soya-atta, soya- snacks, soya-srikhand, namkins</p>	<p>Preparation of soya milk, soya paneer (tofu), soya- atta, soya- snacks, soya- srikhand, namkins</p>
16-17	<p>Groundnut decorticators Different groundnut decorticators Decortications, cleaning, grading and packaging.</p>	<p>Working with groundnut decorticators for production of decorticated groundnut.</p>
18-19	<p>Storage and packaging</p>	<p>Pack the given food products and</p>

	Need and importance of storage and packaging methods Quality standards for packed processed products.	seal Development of good quality package and testing of the quality with market survey and demand.
20-22	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 agro processing.	Application of HACCP and GMP in agro processing industry. Utilization of agro industry wastes:
23-25	Industrial Training in Agro processing 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 DGET institutes
Instructor	<ul style="list-style-type: none"> • One full-time instructor is required for 1000 seats and above • For seats less than 1000, the instructor may be out sourced/ hired on contract basis.

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 4. Labour Welfare 5. Legislation 6. Quality Tools	Final examination at the end of second semester

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	<p>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.</p> <p>Information Security and antivirus tools, Do's and Don'ts in Information Security, Awareness of IT – ACT, types of cyber crimes.</p>
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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
	Attitude

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

10. INFRASTRUCTURE

1. Instructors' Qualification	(i) National Trade Certificate in Agro Processing/Mechanic agriculture machinery trade with three years experience in relevant industry. OR (ii) Diploma in Food Technology with two years experience in relevant industry. OR (iii) Degree in Food 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 STANDARDS

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		
	Recognize & comply safe working practices, environment regulation and housekeeping.	
	Work in a team, understand and practice soft skills, technical English to communicate with required clarity.	
	Explain energy conservation, global warming, and pollution and contribute in the day to day work by optimally using available resources.	
	Explain personnel finance, entrepreneurship, and manage/organize related task in the day to day work for personal & societal growth.	
	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		
	Operate agro machinery ; hammer mill, mini rice mill, ground nut decorticator hand operated, grain cleaner, mini oil expeller, grain cleaner, wheat flour mill, micro pulveriser, mini dal mill, destoner, packing machine(heat sealing machine), weighing balance, extruder.	
	Explain composition and structure for different cereals and pulses	
	Explain structure and suitable storage conditions for cereal grains	
	Practice and explain various pre processing activities in cereal grains and prepare products	
	Prepare products from different pulses	
	Check the quality parameters for raw materials and finished products	
	Explain packaging methods and materials used for different cereals and pulses	
	Sub-Total of Internal assessment for Semester- I	20
	Demonstrate the knowledge of general safety of machinery and practice first aid treatment and hygienic and sanitary conditions as per HACCP and GMP.	
	Prepare and demonstrate spice grinding	
	Demonstrate and explain processing of paddy for rice milling	

	Demonstrate and explain oil extraction	
	Prepare soya products(soya flour, soya paneer (tofu))	
	Packaging, sealing and testing the quality of prepared products with market survey	
	Explain food regulations	
	Sub-Total of Internal assessment for Semester- II	
	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: AGRO PROCESSING
LIST OF TOOLS & EQUIPMENTS

Equipment, Machine & Tools		
Sl. No.	Item/ Specification	Quantity proposed batch of 20 for a trainees
1	Hammer mill : Power operated, one HP 50 Kg/hr	1
2	Groundnut decorticator hand operated : Hand operated 20 Kg/hr	1
3	Mini dal mill : Power operated, 2 HP 100 Kg/hr	1
4	Mini rice mill : Power operated, 2 HP 100 Kg/hr	1
5	Mini oil expeller : Power operated, 10 HP 25 lit/hr	1
6	Grain cleaner : Power operated, 01 HP; 300 Kg/hr	1
7	Mini grain mill : Power operated, 01 HP 20 Kg/hr	1
8	Wheat flour mill : Power operated 5 HP 100 Kg/hr	1
9	Micro pulveriser : Power operated, 2 HP 50 Kg/hr	1
10	Storage bins of different capacity :Aluminium, 10-50 Kg Capacity with proper outlet and inlet	As required
11	Platform scale balance : 100 Kg Capacity,	1
12	Electric oven : For moisture determination, 0-250 °C, digital display (2*2*2)	1
13	Moisture box : Aluminium, 100 g capacity cylindrical	1
14	De-stoner : For cleaning light materials, air classifier type	1
15	Packaging material : PP, PE, laminated, Stand pouches	As required
16	Extruder : Lab scale	1
17	Weighing Balance (0.10 gm to 2 kg), (100 gm to 5 kg)	2
18	Soya milk plant with kettle and paneer press	1

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.

- 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