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

COMPETENCY BASED CURRICULUM

AGRO PROCESSING

(Duration: One Year)

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL-3.5

SECTOR – FOOD INDUSTRY

Directorate General of Training

AGRO PROCESSING

(Non-Engineering Trade)

(Revised in March 2023)

Version: 2.0

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL – 3.5

Developed By

Ministry of Skill Development and Entrepreneurship

Directorate General of Training

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1. COURSE INFORMATION

During the one-year duration of 'Agro Processing' trade, a candidate is trained on Professional Skill, Professional Knowledge and Employability Skill related to job role. In addition to this, a candidate is entrusted to undertake project work, extracurricular activities and on-the-job training to build up confidence. The broad components covered under Professional Skill subject are as below:

The trainee learns the explanation of structures and suitable storage conditions for cereal grains. He/she is able to explain composition and structure of different cereals and pulses. 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. The trainee practices and explains various pre-processing activities in cereal grains prepared products; he/she is able to explain packaging methods and materials for finished products from different cereals and pulses; prepare products from different pulses; check the quality parameters for raw materials & finished products; explain the food regulations.

The trainee is trained to prepare and demonstrate spice grinding and packaging. He/she learns to demonstrate and explain oil extraction; processing of paddy for rice milling; learns to prepare soya products (soya milk, soya flour, soya paneer (tofu), operate groundnut decorticators for production of decorticated groundnut; pack, seal and test the quality of prepared products with market survey; demonstrate the knowledge of general safety of machinery and practice first aid treatment and hygienic and sanitary conditions as per HACCP and GMP.

2. TRAINING SYSTEM

2.1 GENERAL

The Directorate General of Training (DGT) under Ministry of Skill Development & Entrepreneurship offers a range of vocational training courses catering to the need of different sectors of the economy/ labour market. The vocational training programs are delivered under the aegis of Directorate General of Training (DGT). Craftsman Training Scheme (CTS). Craftsman Training Scheme (CTS) with variants and Apprenticeship Training Scheme (ATS) are two pioneer programs of DGT for propagating vocational training.

Agro Processing trade under CTS is one of the popular courses delivered nationwide through a network of ITIs. The course is of one year duration. It mainly consists of Domain area and Core area. The Domain area (Trade Theory & Practical) imparts professional skills and knowledge, while Core area (Employability Skill) imparts requisite core skills, knowledge, and life skills. After passing out the training program, the trainee is awarded National Trade Certificate (NTC) by DGTwhich is recognized worldwide.

Candidates broadly need to demonstrate that they are able to:

- Read and interpret parameters/documents, plan and organize work processes, identify necessary materials and tools;
- Perform tasks with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;
- Apply professional skill, knowledge & employability skills while performing jobs.
- Document the parameters related to the task undertaken.

2.2 PROGRESSION PATHWAYS

- Can join industry as Craftsman and will progress further as Senior Craftsman, Supervisor and can rise up to the level of Manager.
- Can become Entrepreneur in the related field.
- Can join Apprenticeship programs in different types of industries leading to a National Apprenticeship certificate (NAC).
- Can join Crafts Instructor Training Scheme (CITS) in the trade for becoming instructor in ITIs.
- Can join Advanced Diploma (Vocational) courses under DGT as applicable.

2.3 COURSE STRUCTURE

Table below depicts the distribution of training hours across various course elements during a period of one year: -

S No.	Course Element	Notional Training Hours
1.	Professional Skill (Trade Practical)	840
2.	Professional Knowledge (Trade Theory)	240
3.	Employability Skills	120
	Total	**1200**

Every year 150 hours of mandatory OJT (On the Job Training) at nearby industry, wherever not available then group project is mandatory.

On the Job Training (OJT) / Group Project	150
Optional courses (10th/ 12th class certificate along with ITI certification, or, add on short term courses)	240

Trainees of one-year or two-year trade can also opt for optional courses of up to 240 hours in each year for 10th/ 12th class certificate along with ITI certification, or, add on short term courses.

2.4 ASSESSMENT & CERTIFICATION

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

a) The **Continuous Assessment** (Internal) during the period of training will be done by **Formative Assessment Method** by testing for assessment criteria listed against learning outcomes. The training institute has to maintain an individual trainee portfolio as detailed in assessment guideline. The marks of internal assessment will be as per the formative assessment template provided on www.bharatskills.gov.in

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

2.4.1 PASS REGULATION

For the purposes of determining the overall result, weightage of 100% is applied for six months and one year duration courses and 50% weightage is applied to each examination for two years courses. The minimum pass percent for Trade Practical and Formative assessment is 60% & for all other subjects is 33%. .

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 the assessment. Due consideration should be given while assessing for teamwork, avoidance/reduction of scrap/wastage and disposal of scrap/waste as per procedure, behavioral attitude, sensitivity to the 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 some of 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
- Computer based multiple choice question examination
- Practical Examination

Evidences and records of internal (Formative) assessments are to be preserved until forthcoming examination for audit and verification by examining body. The following marking pattern to be adopted for formative assessment:

Performance Level	Evidence
(a) Marks in the range of 60%-75% to be allotted during assessment	
For performance in this grade, the candidate should produce work which demonstrates attainment of an acceptable standard of craftsmanship with occasional guidance, and	• Demonstration of good skills and accuracy in the field of work/ assignments. • A fairly good level of neatness and

due regard for safety procedures and practices	consistency to accomplish job activities. • Occasional support in completing the task/ job.
(b) Marks in the range of 75%-90% to be allotted during assessment	
For this grade, a candidate should produce work which demonstrates attainment of a reasonable standard of craftsmanship, with little guidance, and regard for safety procedures and practices	• Good skill levels and accuracy in the field of work/ assignments. • A good level of neatness and consistency to accomplish job activities. • Little support in completing the task/job. •
(c) Marks in the range of more than 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 of craftsmanship.	• High skill levels and accuracy in the field of work/ assignments. • A high level of neatness and consistency to accomplish job activities. • Minimal or no support in completing the task/ job.

Miller, Food Grains: Processes rice, wheat, pulses, spices and other food grains by operating one or more machines or by supervising their operations by other workers. Adjusts and operates machines for removing husk or bran from grains, polishing rice, grinding and crushing grain and spices into smaller pieces or powder, grinding, shifting and screening grains, flour or spices etc.; observes and supervises milling process for desired results, maintains flow of milled product by regulating flow of ingredients in specified proportion; removes obstructions by tapping clogged spouts with mallet and by adjusting gates; examines product periodically by rubbing sample between fingers or comparing it with colour and texture of standard sample; keeps records of materials received and products milled. May supervise other workers at various stages of processing. May be designated according to type of grains milled or processed such as Miller Rice; Miller Spices; Miller Dal etc.

Husker, Machine (Food grain): Hullerman, Grain operates husking machine to separate grain from its outer covering or shell. Starts machine; pours grain into storage bin attached to machine; regulates feeding of grain into machine by manipulating lever: examines hulled grain periodically for proper husking and adjusts machine as necessary; switches off machine after completion of process or when machine does not function properly; removes minor defects and reports major defects to supervisor for rectification. Cleans and oils machine when not in use. May keep production reports, may direct workers in storage of graded grain.

Roller Man (Food grain): Operates rolling machine to crush grain into flour. Adjusts rollers according to fineness of grinding required; starts machine and regulates flow of grain from hopper to grinding rolls; observes crushing process keeping grain moving at regular rate by tapping clogged spouts with mallet (a wooden hammer or one made of rubber or raw hide) and by adjusting gates; examines product periodically by rubbing sample between fingers or by comparing texture with those of standard sample; detects working defects if any of machine by sight or sound; removes minor defects and reports major defects to supervisor for rectification. May clean roller machine and also roll flour.

Flour Mill Operator: Operates grinding machine or mill to grind wheat, gram or other grains into flour or animal feed. Sets mill by adjusting roller according to fineness of grinding desired; feeds grain into feeding bin of mill by hand; observes process, keeping grain moving at regular rate by tapping clogged spouts with hammer and by adjusting gates; examines crushed product periodically by feel of fingers and adjusts roller as necessary; removes flour collected in bag or container at delivery end; cleans and oils machinery. May weigh grain and flour, calculate charges and collect payment of services rendered to customers. May dress mill stones.

Oil Crusher Operator, Power: Operates crushing machine for extracting oil from seed such as cotton seed, castor seed, copra and groundnut. Places empty container below crusher; starts machine and feeds oil seeds into hopper of machine; sprinkles prescribed quantity of water

over oil seeds to moisten them; turns hand wheel to adjust pressure between rollers and ensures that oil is properly extracted; examines oil cakes visually or by touch to determine that sufficient quantity of oil has been removed; removes container when filled with oil at delivery end for further processing and replaces it with empty one; take out oil cakes from hopper of crusher and fills hopper with fresh oils seeds to maintain continuous production; cleans and oils machine and keeps work place clean and tidy. May specialize in extraction of oil from, particular type of seed. May operate animal driven indigenous crusher for extracting oil from seeds. May operate filter crushed oil.

Reference NCO-2015:

a) 8160.0700 - Miller, Food Grains
b) 8160.0800 - Husker, Machine (Food Grains)
c) 8160.0900 - Roller Man, (Food Grains)
d) 8160.1000 - Flour Mill Operator
e) 8160.1200 - Oil Crusher Operator, Power

Reference NOS:

a) FIC/N1005
b) FIC/N1009
c) FIC/N9001
d) FIC/N1029
e) FIC/N1030
f) FIC/N8011
g) FIC/N7003
h) FIC/N9412
i) FIC/N9413
j) FIC/N9414
k) FIC/N9415

4. GENERAL INFORMATION

Name of the Trade	**Agro Processing**
NCO - 2015	8160.0700, 8160.080, 8160.0900, 8160.1000, 8160.1200
NOS Covered	FIC/N1005, FIC/N1009, FIC/N9001, FIC/N1029, FIC/N1030, FIC/N8011, FIC/N7003, FIC/N9412, FIC/N9413, FIC/N9414, FIC/N9415
NSQF Level	Level-3.5
Duration of Craftsmen Training	One Year (1200 Hours+150 hours OJT/Group Project)
Entry Qualification	Passed 10th Class examination
Minimum Age	14 years as on first day of academic session.
Eligibility for PwD	LD, CP, LC, DW, AA, LV, HH, DEAF, AUTISM, SLD
Unit Strength (No. of Student)	24 (There is no separate provision of supernumerary seats)
Space Norms	96 Sq. m
Power Norms	6 KW
Instructors Qualification for:	
(i) Agro Processing Trade	B.Voc/ Degree in Food Technology/ Food Engineering/Food processing from recognized Board/ University with one year experience in relevant industry. OR Diploma (Minimum 2 years) in Food Technology/Food Engineering /Food processing from recognized board/ University DGT with two years experience in relevant industry. OR NTC/NAC Passed in the trade of "Agro Processing" with three years experience in relevant Field. **<u>Essential Qualification:</u>** Relevant Regular / RPL variants of National Craft Instructor Certificate (NCIC) under DGT. **NOTE: - Out of two Instructors required for the unit of 2 (1+1), one must have Degree/Diploma and other must have NTC/NAC qualifications. However, both of them must possess NCIC in any of its variants.**

(ii) Employability Skill	MBA/ BBA / Any Graduate/ Diploma in any discipline with Two years' experience with short term ToT Course in Employability Skills. (Must have studied English/ Communication Skills and Basic Computer at 12th / Diploma level and above) **OR** Existing Social Studies Instructors in ITIs with short term ToT Course in Employability Skills.
(iii) Minimum Age for Instructor	21 Years
List of Tools and Equipment	As per Annexure – I

5. LEARNING OUTCOME

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

5.1 LEARNING OUTCOMES

1. Explain structures and suitable conditions for cereal grains following safety precautions. (NOS: FIC/N9412)
2. Explain composition and structure of different cereals and pulses. (NOS: FIC/N9413)
3. 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. (NOS: FIC/N1005, FIC/N1009)
4. Practice and explain various pre-processing activities in cereal grains prepared products. (NOS: FIC/N9415)
5. Explain packaging methods and materials for finished products from cereals and pulses. (NOS: FIC/N1005)
6. Prepare products from different pulses. (NOS: FIC/N1005)
7. Check the quality parameters for raw materials & finished products. (NOS: FIC/N1005)
8. Explain the food regulations. (NOS: FIC/N9001)
9. Prepare and demonstrate spice grinding and packaging. (NOS: FIC/N8509)
10. Demonstrate and explain oil extraction. (NOS: FIC/N1029, FIC/N1030)
11. Demonstrate and explain processing of paddy for rice milling. (NOS: FIC/N1005)
12. Prepare soya products (soya milk, soya flour, soya paneer (tofu). (NOS: FIC/N8011)
13. Operate groundnut decorticators for production of decorticated groundnut. (NOS: FIC/N9414)
14. Pack, seal and test the quality of prepared products with market survey. (NOS: FIC/N7003)
15. Demonstrate the knowledge of general safety of machinery and practice first aid treatment and hygienic and sanitary conditions as per HACCP and GMP. (NOS: FIC/N9001)

6. ASSESSMENT CRITERIA

LEARNING OUTCOMES	ASSESSMENT CRITERIA
1. Explain structure and suitable storage conditions for cereal grains following safety precautions. (NOS: FIC/N9412)	Identify different types of storage structures for different cereal grains (cover, grain bins, warehouses & silos).
	Enlist the specifications for storage structures.
2. Explain composition and structure of different cereals and pulses. (NOS: FIC/N9413)	Identify cereals (wheat, rice, corn, barley, sorghum, and oats).
	Identify pulse (green gram, black gram, horse gram, pigeon pea, and lentil).
	Demonstrate the knowledge of composition, nutritional value and structure of cereals and pulses.
3. 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. (NOS: FIC/N1005, FIC/N1009)	Describe the safety measures before operating machinery.
	Demonstrate the working principles for all machinery.
	Identify the basic faults and remove the problems.
	Evaluate the capacity of different agro processing machines.
4. Practice and explain various pre-processing activities in cereal grains and prepare products. (NOS: FIC/N9415)	Describe the preprocessing methods (cleaning, grading).
	Prepare whole wheat flour, maida, dalia, suji.
	Prepare cereal based products like macaroni, noodles, spaghetti and vermicelli.
	Determine the starch content.
5. Explain packaging methods and materials for finished products from different cereals and pulses. (NOS: FIC/N1005)	Identify different packaging materials.
	Describe the packing and labeling methods in agro industry.
6. Prepare products from different pulses. (NOS:	Describe the pretreatment in dal milling like cleaning, grading, soaking and drying.

FIC/N1005)	Prepare dal by pulse milling. e.g. pigeon pea, green gram, Bengal gram.
	Prepare whole pulses for packing. like Bengal gram, black gram, green gram and ground nut.
	Demonstrate and explain packing machines and equipments used for packing of finished products.
7. Check the quality parameters for raw materials and finished products. (NOS: FIC/N1005)	Determination of moisture content of flour from cereals and pulses.
	Determination of starch content in different cereal grains.
	Check the adulteration in pulses.
8. Explain the food regulations. (NOS: FIC/N9001)	Explain and follow food safety standards act, 2006 BIS, ISO-22000, Agmark, HACCP, and International Food Standards GMP.
	Use of agro industry waste.
9. Prepare and demonstrate spice grinding and packaging. (NOS: FIC/N8509)	Identify and procure the raw materials for spice grinding like coriander, black pepper, red chili, and turmeric.
	Describe the preprocessing of spices, cleaning, grading, destoning.
	Demonstrate the working principle for the production of spice powders.
	Describe the method of packing of whole spice for marketing like black pepper.
10. Demonstrate and explain oil extraction. (NOS: FIC/N1029, FIC/N1030)	Demonstrate the knowledge of working for oil expellers.
	Explain the different methods for oil extraction from different oil seeds like mustard, ground nut.
	Describe various processing steps involved in oil extraction like filtration, refining, purification, deodorization, stabilization, and hydrogenation.
11. Demonstrate and explain processing of paddy for rice milling. (NOS: FIC/N1005)	Describe paddy processing in lab.
	Demonstrate the parboiling process for rice milling.
	Demonstrate and explain the packing of rice, weighing, bagging, sealing machine.
12. Prepare soya products (soya flour, soya paneer (tofu). (NOS: FIC/N8011)	Prepare soya products.
	Describe the processing methods of soya flour, soya paneer (tofu), soya milk.
13. Operate groundnut	Explain Decortication process.

decorticators for production of decorticated groundnut. (NOS: FIC/N9414)	Perform decortications using the groundnut decortications machine.
	Perform cleaning/grading/packaging of groundnuts.
14. Pack, seal and test the quality of prepared products with market survey. (NOS: FIC/N7003)	Identify the packaging material for suitable storage conditions.
	Describe the packing methods.
15. Demonstrate the knowledge of general safety of machinery and practice first aid treatment and hygienic and sanitary conditions as per HACCP and GMP. (NOS: FIC/N9001)	Describe the general safety precautions and handling of equipments to prevent accidents.
	Identify the safety equipments.
	Describe the knowledge about HACCP and GMP.

7. TRADE SYLLABUS

SYLLABUS FORAGRO PROCESSING TRADE			
DURATION: ONE YEAR			
Duration	**Reference Learning Outcome**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
Professional Skill 40 Hrs; Professional Knowledge 18 Hrs	Explain structures and suitable storage conditions for cereal grains following safety precautions.	1. Functional and structural designs of grain storage structure such as cover, grain bins, warehouses and silos. 2. BIS specification for storage structures and design.	**Agro processing industry** Introduction and scope of agro processing industries in India. Status, Production and utilization of cereals and pulses in India and the world. Scope of agro processed products for entrepreneurship. Introduction to operation green revolution.
Professional Skill 60 Hrs; Professional Knowledge 18 Hrs	Explain composition and structure of different cereals and pulses.	3. Structure of important cereals (Wheat, rice, corn, barley, sorghum, oats). 4. Structure of important Pluses. (Green gram, horse gram, pigeon pea, lentil, black gram).	**Structure and composition:** The chemical compositions and nutritional values of cereal, pulses and oil seeds. Importance of cereal, pulses and oil seeds in diet. Distribution of vitamins, protein, minerals, carbohydrates and fats in different grains and their relevance to milling.
Professional Skill 100 Hrs; Professional Knowledge 24 Hrs	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.	Working with agro processing machinery : 5. Hammer mill, Groundnut decorticator hand operated, Mini dal mill, Mini rice mill, Mini oil expeller, Grain cleaner, Mini grain mill, Wheat flour mill, Micro pulveriser and Destoner, Packaging machine (Heat sealing machine), Weighing Balance, Extruder. 6. Handling and practice on the equipment. 7. Fault identification and removal of faults.	**Machinery in Agro processing** Different machines used in agro processing industry; working principles operation and maintenance. Maintenance of equipment, Safety.

Professional Skill 70 Hrs; Professional Knowledge 18 Hrs	Practice and explain various pre-processing activities in cereal grains prepared products.	8. Cleaning, grading and other pre-processing activities. 9. Production of whole wheat flour. 10. Production of Suji, Maida, Dalia. 11. Production of cereal based product like macaroni, noodles, spaghetti and vermicelli.	**Cereal grains, wheat** Different grains suitable for agro processing Primary processing of wheat. Methods of Cleaning, grading, milling. Secondary processing of wheat. Production of different wheat product.
Professional Skill 55 Hrs; Professional Knowledge 12 Hrs	Explain packaging methods and materials for finished products from different cereals and pulses.	12. Study of packaging equipment and machinery used for packing of agro processed products. 13. Packaging and labelling of the cereal products. 14. Production of packed whole pulse like Bengal gram, black gram, green gram, groundnut. 15. Packaging and uses of wastes from dal mill.	**Packaged whole pulses and cereals:** Packaging, labelling, storage and marketing of whole grains. Study the various type of packaging materials used in agro processing industry.
Professional Skill 55 Hrs; Professional Knowledge 12 Hrs	Prepare products from different pulses.	16. Pre-treatment in dal milling like cleaning, grading, soaking and drying. 17. Milling pulses for production of dal e.g. pigeon pea, green gram, Bengal gram. 18. Preparation of products from different pulses.	**Dal (Pulse) Milling:** Pre milling treatments of pulses, pulse milling and recent developments. Principle of dal milling. Pulses suitable for milling. Different methods of dal milling working and principle of dal mill. Pre-treatment in dal milling Waste utilization.
Professional Skill 50 Hrs; Professional Knowledge 12 Hrs	Check the quality parameters for raw materials & finished products.	19. Determination of starch content from wheat flour. 20. Estimation of moisture content in cereals flour. 21. Determination of different quality parameters in cereals and pulses product.	Factors affecting quality of food grains. Standards for the wheat flour. Adulteration in wheat flour. Adulteration in pulses **Cereals and pulses industry By-Products:** 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.
Professional Skill 50 Hrs; Professional Knowledge 12 Hrs	Explain the food regulations.	22. Necessity of housekeeping. Maintaining general safety. 23. First aid practice & treatment. 24. Safety precautions taken & use safety equipment's including fire fighting equipment's. 25. Familiarization of organization & their Agro Industries products unit. 26. Handling of tools, equipment's, & machineries in the section & proper utilization & upkeep. 27. Indenting & procurement of tools and materials from store as need. 28. Conducting survey of the different agro products from the market.	**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 industry.
Professional Skill 80 Hrs; Professional Knowledge 18 Hrs	Prepare and demonstrate spice grinding and packaging.	29. Procurement and Pre-processing of spices, cleaning, grading, de-stoning working with machinery for spice grinding. 30. Production of spice powders from, coriander, black pepper, red chilly, turmeric Packaging of whole spice for marketing.	**Spice Grinding** Production of major spices in India & their importance in Indian diet. Spices suitable for processing. Unit operations in spices processing: Principles, method and machinery in spice grinding. Quality assurance & methods to detect adulteration.
Professional Skill 70 Hrs; Professional Knowledge 18 Hrs	Demonstrate and explain oil extraction.	31. Working of oil expellers Oil expelling from different oil seeds e.g. mustard, groundnut, and rapeseed, sunflower. 32. Filtration and packaging of oil. **Different quality parameters :** 33. Peroxide value, FFA, acid	**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.

		value. 34. Detect the adulteration in oils.	Oilseeds, properties and suitability. Process flow chart of oil extractions. Filtration and packaging. **Oil refining and purification :** Refining, purification, deodorization, stabilization and hydrogenation.
Professional Skill 60 Hrs; Professional Knowledge 18 Hrs	Demonstrate and explain processing of paddy for rice milling.	35. Processing of paddy for rice in lab. 36. Practical demonstration on rice milling process in Rice mill. 37. Packaging of rice: Weighing, bagging, Sealing machines.	**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.
Professional Skill 60 Hrs; Professional Knowledge 18 Hrs	Prepare soya products (soya milk, soya flour, soya paneer (tofu).	38. Preparation of soya milk, soya paneer (tofu), soya-atta, soya-snacks, soya-srikhand, namkins.	**Soya Products** Details of soya product Processing methods of soya milk, soya paneer (tofu), soya-atta, soya- snacks, soya-srikhand, namkins
Professional Skill 20 Hrs; Professional Knowledge 12 Hrs	Operate groundnut decorticators for production of decorticated groundnut.	39. Working with groundnut decorticators for production of decorticated groundnut.	**Groundnut decorticators** Different groundnut decorticators Decortications, cleaning, grading and packaging.
Professional Skill 40 Hrs; Professional Knowledge 12 Hrs	Pack, seal and test the quality of prepared products with market survey.	40. Pack the given food products and seal. 41. Development of good quality package and testing of the quality with market survey and demand.	**<u>Storage and packaging</u>** Need and importance of storage and packaging methods Quality standards for packed processed products.

Professional Skill 30 Hrs; Professional Knowledge 18 Hrs	Demonstrate the knowledge of general safety of machinery and practice first aid treatment and hygienic and sanitary conditions as per HACCP and GMP.	42. Application of HACCP and GMP in agro processing industry. 43. Utilization of agro industry wastes:	**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.
Industrial Training in Agro processing industry			

SYLLABUS FOR CORE SKILLS
1. Employability Skills (Common for all trades) (120 Hrs.)

Learning outcomes, assessment criteria, syllabus and Tool List of Core Skills subjects which is common for a group of trades, provided separately in www.bharatskills.gov.in/ dgt.gov.in

ANNEXURE-I

LIST OF TOOLS & EQUIPMENT			
AGRO PROCESSING (For batch of 24 candidates)			
S No.	**Name of the Tools and Equipment**	**Specification**	**Quantity**
A : Equipment, Machine & Tools			
1.	Hammer mill	Power operate done HP 50 Kg/hr	1 No.
2.	Groundnut decorticator	Hand operated 20 Kg/hr	1 No.
3.	Mini dal mill	Power operated, 2 HP 100 Kg/hr	1 No.
4.	Mini rice mill	Power operated, 2 HP 100 Kg/hr	1 No.
5.	Mini oil expeller	Power operated, 10 HP 25 lit/hr	1 No.
6.	Grain cleaner	Power operated, 01 HP; 300 Kg/hr	1 No.
7.	Mini grain mill	Power operated, 01 HP 20 Kg/hr	1 No.
8.	Wheat flour mill	Power operated 5 HP 100 Kg/hr	1 No.
9.	Micro pulveriser	Power operated, 2 HP 50 Kg/hr	1 No.
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 No.
12.	Electric oven	For moisture determination, 0-250 °C, digital display (2*2*2)	1 No.
13.	Moisture box	Aluminium, 100 g capacity cylindrical	1 No.
14.	De-stoner	For cleaning light materials, air classifier type	1 No.
15.	Extruder	Lab scale	1 No.
16.	Weighing Balance	(0.10 gm to 2 kg), (100 gm to 5 kg)	2 Nos.
17.	Soya milk plant with kettle and paneer press		1 No.
18.	Automatic household Pasta machine	30x21.5x34.3cm	1 No.
B: Furniture			

Class Room			
19.	Instructor Chair & Table		01 No
20.	Dual Desk		12 No.
Workshop / Lab			
21.	Suitable Work tables		04 No.
22.	Stools		24+1 No.
23.	Discussion Table		01 No.
24.	Tool Cabinet		01 No.
25.	Trainees Locker with space for 20		01 No.
26.	First Aid Box		01 No.
27.	Book Shelf (glass panel)		01 No.

Note:

1. *Internet facility is desired to be provided in the class room.*
2. Raw material, Testing Chemicals and consumables are to be provided as per the requirement.

ANNEXURE - II

The DGT sincerely acknowledges contributions of the Industries, State Directorates, Trade Experts, Domain Experts, trainers of ITIs, NSTIs, faculties from universities and all others who contributed in revising the curriculum. Special acknowledgement is extended by DGT to the following expert members who had contributed immensely in this curriculum.

List of Expert contributed/ participated for finalizing the course curriculum of Agro Processing trade			
S No.	**Name & Designation Sh/Mr/Ms**	**Organization**	**Remarks**
Members of Sector Mentor council			
1.	Dr. D.C Saxena	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. Pardumansingh	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.	PritiDwivedi (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, MaharashiDayanand 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.Kuli (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.	SriyaSumanPatro	Lecturer, Government Polytechnic, Behrampur, Ganjam, Odisha	Member
Industry Member			
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.	RohitVerma	G.M, Jupiter multi-fruit processor Plot no 1, phase III, Industrial area Talliwal, District Una, H.P	Member

ABBREVIATIONS

CTS	Craftsmen Training Scheme
ATS	Apprenticeship Training Scheme
CITS	Craft Instructor Training Scheme
DGT	Directorate General of Training
MSDE	Ministry of Skill Development and Entrepreneurship
NTC	National Trade Certificate
NAC	National Apprenticeship Certificate
NCIC	National Craft Instructor Certificate
LD	Locomotor Disability
CP	Cerebral Palsy
MD	Multiple Disabilities
LV	Low Vision
HH	Hard of Hearing
ID	Intellectual Disabilities
LC	Leprosy Cured
SLD	Specific Learning Disabilities
DW	Dwarfism
MI	Mental Illness
AA	Acid Attack
PwD	Person with disabilities


कौशलं बलम्