



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

COMPETENCY BASED CURRICULUM

FOOD BEVERAGE

(Duration: One Year)

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 4



SECTOR – FOOD INDUSTRY



Directorate General of Training

FOOD BEVERAGE

(Non-Engineering Trade)

(Revised in 2019)

Version: 1.2

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL - 4

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 'Food Beverage' trade, a candidate is trained on Professional Skill, Professional Knowledge and Employability Skill related to the 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 is trained to prepare fruit juices with juice extracting/ pulping machines with safety precautions and preserve fruit juices with addition of preservatives and determine the acidity and TSS content; prepare and pack various type of flavoured milk by using appropriate machines/tools such as homogenizer, autoclave, bottle washer, liquid/bottle filling machine & corking machine with safety precautions and determine the quality of flavoured milk. The trainees also learn to prepare mineral water by using appropriate machines such as mini water plant and explain quality standards (BIS) of water and water treatment process; explain various types of packaging material used in packaging of food beverages products and storage; prepare and pack synthetic beverages such as soft drink by using appropriate machines such as, carbonation machines, autoclave, bottle washer, liquid/bottle filling machine and corking machine with safety precautions, determine the acidity, TSS content, pH value and Sensory evaluation.

The trainee also learns to prepare and pack fermented beverages such as vinegar, fermented juices and lassi by using appropriate machines/ tools such as, fermenter, seed germinator, vinegar generator, autoclave, bottle washer, required fermentation agents, liquid/ bottle filling machine, Chemical solutions and corking machine with safety precautions. He determines the acidity, TSS content, pH value and Sensory evaluation. The Trainee practices to prepare and pack fermented beverages such as whiskey, beer, wine, rum and brandy by using appropriate machines/ tools such as, fermenter, seed germinator, autoclave, bottle washer, required fermentation agents, liquid/bottle filling machine, Chemical solutions and corking machine with safety precautions and determines the alcohol content, acidity, TSS content, pH value and Sensory evaluation; explain food safety standards and beverage industry waste utilization.

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 economy/ Labour market. The vocational training programmes are delivered under the aegis of Directorate General of Training (DGT). Craftsman Training Scheme (CTS) with variants and Apprenticeship Training Scheme (ATS) are two pioneer schemes of DGT for strengthening vocational training.

Food Beverage 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 the 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 DGT which 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 Technician and will progress further as Senior Technician, 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)	1200
2.	Professional Knowledge (Trade Theory)	240
3.	Employability Skills	160
	Total	1600

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 method. 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%. There will be no Grace marks.

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 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 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 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 should produce work which demonstrates attainment of an acceptable standard of craftsmanship with occasional guidance, and due regard for safety procedures and practices	<ul style="list-style-type: none"> • Demonstration of good skills and accuracy in the field of work/ assignments. • A fairly good level of neatness and consistency to accomplish job activities. • Occasional support in completing the task/ job.
(b) Weightage 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	<ul style="list-style-type: none"> • 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) Weightage in the range of more than 90% to be allotted during assessment	
<p>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.</p>	<ul style="list-style-type: none"> • 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.

Chemist, Food; Chemist, Food conducts research and analysis concerning chemistry of foods to develop and improve food and beverages. Experiments with natural and synthetic materials or by-products to develop new foods, additives, preservatives, anti-adulteration agents, and related products. Studies effects of various methods of processing, preservation, and packaging on composition and properties of food, such as color, texture, aroma, taste, shelf life, and nutritive content. Tests food and beverage samples, such as starch, sugar, cereals, beer, canned and dehydrated food products, meats, vegetables, dairy foods, and other products to ensure compliance with food laws, and standards of quality and purity. May perform, or supervise workers performing, quality control tests in food processing, canning, freezing, brewing or distilling.

Food and Beverage Tasters and Graders, Other; Food and Beverages Tasters and Graders, Other include workers who inspect, taste and grade various types of agricultural products, food and beverages not elsewhere classified.

Laboratory Assistant, Food and Beverages/Chemist/Analytical Supervisor/Lab Chemist; Laboratory Assistant, Food and Beverages sets equipment and apparatus and conducts routine test of food, drinks and other edible in laboratory to determine their properties, nutritional value, alcoholic contents etc. and to ensure that they conform to prescribed standards or have not been adulterated. Sets and operates required apparatus such as heaters, hydrometers, thermostats, vacuum pumps etc. depending on nature of test and type of material to be tested such as edibles, butter, milk, cold drinks etc. Performs routine tests of food, beverages, drinks and edibles by chemical processes for determining melting points, specific gravity, boiling point, reaction with chemicals and other factors as directed by Chemists or Food Technologist to find their properties, nutritional value, alcoholic contents etc. Ensures that food and beverages tested conform to prescribed standards, as stated on labels. Reports cases of adulteration, fermentation, putrefaction etc. to senior officers. Washes and cleans apparatus, keeps them in safe custody and maintains records as necessary. Keeps laboratory clean and tidy. May prepare standard solution reagents and other testing media.

Reference NCO-2015:

- a) 2131.1400 – Chemist, Food
- b) 7515.9900 – Food and Beverage Tasters and Graders, Other
- c) 3116.0200 – Laboratory Assistant, Food and Beverages/Chemist/Analytical Supervisor/Lab Chemist

4. GENERAL INFORMATION

Name of the Trade	FOOD BEVERAGE
Trade Code	DGT/1069
NCO - 2015	2131.1400; 7515.9900; 3116.0200
NSQF Level	Level 4
Duration of Craftsmen Training	One Year (1600 Hours)
Entry Qualification	Passed 10 th Class examination with Science and Mathematics or its equivalent
Minimum Age	14 years as on first day of academic session.
Eligibility for PwD	LD, CP LC, DW, AA, LV, HH, DEAF, AUTISM, SLD, ID
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) Food Beverage Trade	<p>B.Voc/Degree in Food Technology from UGC recognized university/ college with one year experience in relevant industry.</p> <p style="text-align: center;">OR</p> <p>Diploma (Minimum 2 Years) in Food Technology form recognized board of education or relevant Advanced Diploma (Vocational) from DGT with two years' experience in relevant industry.</p> <p style="text-align: center;">OR</p> <p>NTC/NAC passed in the trade of "Food Beverage" with three years experience in relevant field.</p> <p>Essential Qualification: Relevant National Craft Instructor Certificate (NCIC) in any of the variants under DGT.</p> <p>Note:- Out of two Instructors required for the unit of 2(1+1), one must have Diploma, and other must have NTC/NAC qualifications. However, both of them must possess NCIC in any of its variants.</p>
(ii) Employability Skill	MBA/ BBA / Any Graduate/ Diploma in any discipline with Two years' experience with short term ToT Course in Employability Skills from

	<p>DGT institutes. (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 from DGT institutes.</p>		
(iii) Minimum Age for Instructor	21 Years		
List of Tools and Equipment	As per Annexure – I		
Distribution of training on hourly basis: (Indicative only)			
Total Hrs /week	Trade Practical	Trade Theory	Employability Skills
40 Hours	30 Hours	6 Hours	4 Hours

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 (TRADE SPECIFIC)

1. Prepare fruit juices with juice extracting/ pulping machines with safety precautions and preserve fruit juices with addition of preservatives and determine the acidity and TSS content following safety precautions.
2. Prepare and pack various type of flavoured milk by using appropriate machines/tools such as homogenizer, autoclave, bottle washer, liquid/bottle filling machine and corking machine with safety precautions, determine the quality of flavoured milk.
3. Prepare mineral water by using appropriate machines such as mini water plant and explain quality standards (BIS) of water and water treatment process.
4. Explain various types of packaging material used in packaging of food beverages products and storage.
5. Prepare and pack synthetic beverages such as soft drink by using appropriate machines such as, carbonation machines, autoclave, bottle washer, liquid/bottle filling machine and corking machine with safety precautions, determine the acidity, TSS content , pH value and Sensory evaluation.
6. Prepare and pack fermented beverages such as vinegar, fermented juices and lassi by using appropriate machines/ tools such as, Fermenter, seed germinator, vinegar generator, autoclave, bottle washer, required fermentation agents, liquid/ bottle filling machine, Chemical solutions and corking machine with safety precautions, determine the acidity, TSS content , pH value and Sensory evaluation.
7. Prepare and pack fermented beverages such as whiskey, beer, wine, rum and brandy by using appropriate machines/tools such as, Fermenter, seed germinator, autoclave, bottle washer, required fermentation agents, liquid/bottle filling machine, Chemical solutions and corking machine with safety precautions, determine the alcohol content, acidity, TSS content , pH value and Sensory evaluation.
8. Explain food safety standards and beverage industry waste utilization.

6. ASSESSMENT CRITERIA

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<p>1. Prepare fruit juices with juice extracting/pulping machines with safety precautions and preserve fruit juices with addition of preservatives and determine the acidity and TSS content following safety precautions.</p>	Maintain the perfect hygiene standard
	Select perfect fruits and other ingredients
	Prepare fruits for juice
	wash fruits.
	Prepare fruits juice
	Measure juice
	Determine TSS
	Determine acidity
	Perform calculation
	Fill the preserved fruit juices in sterilized bottles
	Cork and crown the bottles
	Sterilize the bottles
	Label the bottles
Maintain safety	
<p>2. Prepare and pack various type of flavoured milk by using appropriate machines/tools such as homogenizer, autoclave, bottle washer, liquid/bottle filling machine and corking machine with safety precautions, determine the quality of flavoured milk.</p>	Maintain perfect hygiene standard.
	Describe the nutritional & energy values and quality standards of flavoured milk.
	Select ingredients and machines.
	Prepare flavoured milk.
	Check the quality such TSS, pH, Acidity.
	Fill beverage into sterilized bottles.
	Cork and crown the bottles.
	Label the bottle.
Maintain safety.	
<p>3. Prepare mineral water by using appropriate machines such as mini water plant and explain quality standards (BIS) of water and water</p>	Maintain perfect hygiene standard
	Describe standard of water and types of water hardness.
	Describe temporary water treatment process.
	Explain types of water treatment like R.O., U.V. treatment.
	Explain production of mineral water.
	Production of mineral water.

treatment process.	Maintain safety
4. Explain various types of packaging material used in packaging of food beverages products and storage.	Explain types of packaging material like glass container, tin container, PET bottle, plastic pouches, tetra pack and brick packs.
	Functions of packaging materials.
	Explain merits and demerits of various types packaging material.
	Storage condition of packed products.
5. Prepare and pack synthetic beverages such as soft drink by using appropriate machines such as, carbonation machines, autoclave, bottle washer, liquid/bottle filling machine and corking machine with safety precautions, determine the acidity, TSS content, pH value and sensory evaluation.	Explain manufacturing process of soft drink.
	Maintain perfect hygiene standard.
	Select ingredients and machines.
	Prepare soft drinks by using machines.
	Check the quality such TSS, pH, Acidity.
	Sensory evaluation
	Fill beverage into sterilized bottles
	Add carbon dioxide
	Cork and crown the bottles
	Label the bottle
Maintain safety	
6. Prepare and pack fermented beverages such as vinegar, fermented juices and lassi by using appropriate machines/tools such as, Fermenter, seed germinator, vinegar generator, autoclave, bottle washer, required fermentation agents, liquid/ bottle filling machine, Chemical solutions and	Explain principle of fermentation and process of fermentation.
	Explain manufacturing process of vinegar.
	Maintain perfect hygiene standard
	Select ingredients and machines
	Prepare vinegar and fermented juices by using machines
	Check the quality such TSS, pH, Acidity
	Sensory evaluation
	Fill beverage into sterilized bottles
	cork and crown the bottles
	Label the bottle
Maintain safety	

<p>corking machine with safety precautions, determine the acidity, TSS content , pH value and Sensory evaluation.</p>	
<p>7. Prepare and pack fermented beverages such as whiskey, beer, wine, rum and brandy by using appropriate machines/tools such as, Fermenter, seed germinator, autoclave, bottle washer, required fermentation agents, liquid/bottle filling machine, Chemical solutions and corking machine with safety precautions, determine the alcohol content, acidity, TSS content , pH value and Sensory evaluation.</p>	<p>Explain principle of fermentation and process of fermentation.</p> <p>Explain manufacturing process of beer, whiskey, wine, rum and brandy.</p> <p>Maintain perfect hygiene standard</p> <p>Select ingredients and machines</p> <p>Prepare whiskey, beer, wine, rum and brandy by using machines.</p> <p>Check the quality such alcohol content , TSS, pH, Acidity and Sensory evaluation</p> <p>Fill beverage into sterilized bottles</p> <p>cork and crown the bottles</p> <p>Label the bottle</p> <p>Maintain safety</p>
<p>8. Explain food safety standards and beverage industry waste utilization.</p>	<p>State food safety and standard Act 2006 BIS, ISO-22000, HACCP, International food standards.</p> <p>State Personal Hygiene, cleaning and sanitary standards of beverages industry.</p> <p>State utilization of food beverage industry waste</p>

SYLLABUS FOR FOOD BEVERAGE TRADE			
DURATION: ONE YEAR			
Duration	Reference Learning Outcome	Professional Skills (Trade Practical) With Indicative Hours	Professional Knowledge (Trade Theory)
Professional Skill 360 Hrs.; Professional Knowledge 72 Hrs	Prepare fruit juices with juice extracting/ pulping machines with safety precautions and preserve fruit juices with addition of preservatives and determine the acidity and TSS content following safety precautions.	1. Study of the different food beverages available in the Market. (90 hrs)	Introduction to different food beverage <ul style="list-style-type: none"> • Types of beverages. • Need of particular beverage. • Classification of food beverages. • Raw materials used for beverages. • PFA-standards for food beverages. • Food additives used in different beverages. • Quality of water for beverages. (18 Hrs)
		2. Operate all equipment safely. (45 hrs) 3. Identify and removal of faults in machines. (45 hrs)	Primary processing machinery: <ul style="list-style-type: none"> • Principle and working of equipment used e.g., Juice extractor, pulper, fermenter, vinegar generator, crown corking machine, bottle filling machine, Soda water machine, basket press, filter press, Maintenance of machines safety. (18 Hrs)
		4. Extraction of juice from different fruits. (25 hrs) 5. Preservation of fruits juices with addition of preservative. (35 hrs)	Juice Extractions : <ul style="list-style-type: none"> • Principle and methods for fruits juice manufacture, machinery used in different fruits juice extraction

			<ul style="list-style-type: none"> • Preparation process flow charts of juice extraction from various fruits. <p>Preservative :</p> <ul style="list-style-type: none"> • Definition of Preservatives. • Types of preservatives commonly used in food industry. • Limits of usage of preservatives.(12 Hrs)
		<p>6. Material calculation of Fruit Beverages as per FPO Specification. (40 hrs)</p> <p>7. Preparation of common fruit beverages available in the region such as squashes, crushes, cordial, syrups, nectars, R.T.S. beverages. (40 hrs)</p> <p>8. Determination of Acids in fruits beverages. (20 hrs)</p> <p>9. Determination of TSS with Hand refractometer in fruit Beverage. (20 hrs)</p>	<p>Non Alcoholic Beverages (TEA COFFEE) :</p> <ul style="list-style-type: none"> • Type of non alcoholic beverage. • Preparation process and latest development. • Machinery and equipment for non alcoholic beverages. • Process variable and their control. • Nutritional and energy values <p>Fruit Beverages</p> <ul style="list-style-type: none"> • Introduction to different fruits juices. • Raw materials used in fruit beverages, and their properties. • Machinery involved in different fruits juice extraction. • Principle and preparation methods of Ready-To-Serve (RTS), Squash, fruit juice, nectar, concentrate, syrup, cordial, Process of manufacture. • Quality control in beverage

			<p>industry.</p> <ul style="list-style-type: none"> FPO standards for fruit beverages.(24 Hrs)
<p>Professional Skill 60Hrs.;</p> <p>Professional Knowledge 12 Hrs.</p>	<p>Prepare and pack various type of flavoured milk by using appropriate machines/tools such as homogenizer, autoclave, bottle washer, liquid/bottle filling machine and corking machine with safety precautions, determine the quality of flavoured milk.</p>	<p>10. Preparation of various flavoured milk beverages. (25 hrs)</p> <p>11. Packaging, labelling and storage of flavoured milk. (25 hrs)</p> <p>12. Quality of Flavoured milk. (10 hrs)</p>	<p>Flavoured milk Beverages :</p> <ul style="list-style-type: none"> Raw materials used in flavoured milk beverages, and their properties. Nutritional and energy values. Process of manufacture Quality control(12 Hrs)
<p>Professional Skill 180Hrs;</p> <p>Professional Knowledge 36 Hrs</p>	<p>Prepare mineral water by using appropriate machines such as mini water plant and explain quality standards (BIS) of water and water treatment process.</p>	<p>13. General purification techniques. (25 hrs)</p> <p>14. Production of mineral water from mini water treatment plant. (25 hrs)</p> <p>15. Quality of packaged water. (10 hrs)</p>	<p>Package drinking water :</p> <ul style="list-style-type: none"> Principle and method for production of mineral water. Quality standard (BIS) of water. Different types of water. (12 Hrs)
		<p>16. Production of soda water.(30hrs)</p> <p>17. Packaging, labelling and storage of soda water.(30 hrs)</p>	<p>Soda water :</p> <ul style="list-style-type: none"> Principle and Method of soda water production. Raw material used in soda water, and their properties. Quality standards for soda water. (12 Hrs)
		<p>18. Preparation of malt syrup, badam, pista, herbal, concentrates, rose syrup. (60 hrs)</p>	<p>Miscellaneous Beverage :</p> <ul style="list-style-type: none"> Beverage from other materials, grains malt, vegetable (tomato), herbs & medicinal plants.(12 Hrs)
<p>Professional Skill 60Hrs;</p>	<p>Explain various types of packaging material used in packaging of</p>	<p>19. Practical demonstration of bottle filling machine. (60 hrs)</p>	<ul style="list-style-type: none"> Study of various types of containers like Glass, Tin-merits and demerits of each-

Professional Knowledge 12 Hrs	food beverages products and storage.		scope for new types of containers/ packaging materials, such as plastic pouches, brick packs, tetra pack, PET bottle and cartons.(12 Hrs)
Professional Skill 210 Hrs; Professional Knowledge 42 Hrs	Prepare and pack synthetic beverages such as soft drink by using appropriate machines such as, carbonation machines, autoclave, bottle washer, liquid/bottle filling machine and corking machine with safety precautions, determine the acidity, TSS content , pH value and Sensory evaluation.	<p>Food beverage</p> <p>20. Importance of food beverages for entrepreneurship. (10 hrs)</p> <p>21. Scope of food beverages. (10 hrs)</p> <p>22. Beverages and its importance in modern life. (20 hrs)</p> <p>23. Industrial growth and development. (20 hrs)</p> <p>Synthetic soft drinks :</p> <p>24. Study the role of ingredients used in production of soft drink. (25 hrs)</p> <p>25. Process of manufacture of soft drinks. (15 hrs)</p> <p>26. Quality of water for soft drinks. (25 hrs)</p> <p>27. Study the detail of various water treatment processes. (25 hrs)</p> <p>28. Food additives used in soft drinks. (30 hrs)</p> <p>29. Quality control in a soft drink manufacturing industry. (30 hrs)</p>	<ul style="list-style-type: none"> • Study of the different carbonated and non carbonated, alcoholic and non alcoholic, fermented and unfermented beverages available in the market.(12 Hrs) • Selection of ingredients for soft drink production • Preparation of different soft drinks. • Packaging of the soft drinks (PET Bottling, canning) • Quality testing in soft drinks. (30 Hrs)
Professional Skill 150 Hrs; Professional	Prepare and pack fermented beverages such as vinegar, fermented juices and	<p>Fermented beverages :</p> <p>30. Study of Fermented vinegars. (25 hrs)</p>	<ul style="list-style-type: none"> • Preparation of malt extract • Preparation of cider, vinegar, banana, pineapple beverages. • Quality testing in fermented

<p>Knowledge 30 Hrs</p>	<p>lassi by using appropriate machines/ tools such as, Fermenter, seed germinator, vinegar generator, autoclave, bottle washer, required fermentation agents, liquid/ bottle filling machine, Chemical solutions and corking machine with safety precautions, determine the acidity, TSS content , pH value and Sensory evaluation.</p>	<p>31. Principle of Vinegar Production. (25 hrs) 32. Principle and methods used in preparation of fermented beverages. (25 hrs) 33. Ingredients used in productions of fermented beverages. (25 hrs) 34. Fermentation. (25 hrs) 35. Storage. (25 hrs)</p>	<p>beverages.</p> <ul style="list-style-type: none"> • Packaging of the fermented beverages. • Fermentation of Fruits juices. • Preparation of whey (lassi) from milk. (30 Hrs)
<p>Professional Skill 120 Hrs; Professional Knowledge 24 Hrs</p>	<p>Prepare and pack fermented beverages such as whiskey, beer, wine, rum and brandy by using appropriate machines/tools such as, Fermenter, seed germinator, autoclave, bottle washer, required fermentation agents, liquid/bottle filling machine, Chemical solutions and corking machine with safety precautions, determine the alcohol content, acidity, TSS content , pH value and Sensory evaluation.</p>	<p>Alcoholic Beverages : 36. Commercial process details of manufacturing alcoholic beverages like whiskey, beer, wine, rum, brandy. (35 hrs) 37. Role of ingredients used in production of various alcoholic beverages. (45 hrs) 38. Nutritional and energy values of these products. (40 hrs)</p>	<ul style="list-style-type: none"> • Selection of ingredients for the production of whiskey, beer, wine, rum, brandy. • Demonstrations of beer, whiskey, wine, rum and brandy. • Quality testing in alcoholic beverages. • Packaging of the alcoholic beverages. • Industrial visit of alcoholic beverages industry.(24 Hrs)

<p>Professional Skill 60 Hrs;</p> <p>Professional Knowledge 12 Hrs</p>	<p>Explain food safety standards and beverage industry waste utilization</p>	<p>Food safety and regulations</p> <p>39. FSSAI: FDA, Codex Alimentarius, PFA, FPO, BIS, ISO-22000, Agmark, Overview of Food Safety and Standards Act, 2006, HACCP, Food Safety Management System, International Food Standard (SPS, TBT, Drug, Residues Chemicals, GMO) GMP (Good Manufacturing Practices). (30 hrs)</p> <p>40. Importance of personal Hygiene, Cleaning & Sanitary standards of Food beverages industry. (30 hrs)</p>	<ul style="list-style-type: none"> • Application of HACCP and GMP in Food beverages industry. • Utilization of Food beverages industry wastes.(12 Hrs)
<p>Industrial Training in Alcoholic or carbonated beverage industry</p>			

SYLLABUS FOR CORE SKILLS

1. Employability Skills (Common for all CTS trades) (160 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

LIST OF TOOLS & EQUIPMENT			
FOOD BEVERAGE			
(For a batch of 24 Candidates)			
S No.	Name of the Tools and Equipment	Specification	Quantity
A. EQUIPMENT, MACHINE & TOOLS			
1.	Oven	5 KW	1 no.
2.	Platform scale balance	100 Kg Capacity	1 no.
3.	Soda making machines		1 no.
4.	Seed germinator	Cabinet type, Different chambers, Temp and RH Controller	1 no.
5.	Vinegar generator	Chamber made of SS, with sparger and baffles	1 no.
6.	Fermenter	Bioreactor, SS, with sparger and baffles	1 no.
7.	Slicing machine		1 no.
8.	Automatic pouch machine / filler sealer machine		1 no.
9.	Pulping Machine/Pulper for fruits and		1 no.
10.	Steam jacket kettle 50 litre double jacketed with indenting lever, steam inlet and outlet with steel trolley and accessories to be fitted with boiler.		1 no.
11.	Fruit mill		1 no.
12.	Juice Extractor		1 no.
13.	Corking machines		1 no.
14.	Can seamer		1 no.
15.	Exhaust box		1 no.
16.	Auto clave		1 no.
17.	Cup sealer		1 no.
18.	Steel scale	12 " standard steel	2 nos.
19.	Steel tape	Scales 1 meter, and of 50 ft	2 nos.
20.	Digital weighing balance		03 nos.

21.	Cutting equipments	Different knives, Cutters for fruits /Vegetables	As required
22.	Mini water treatment plant		1 no.
23.	Hot plate	Electrical 2 KW	1 no.
24.	Refrigerator	220 litre	1 no.
25.	Tanks SS	50 liters capacity, cylindrical with cap	1 no.
26.	Syrup tanks	50, 100 lit capacity SS	1 no. each
27.	Pressure Cooker	5 Kg and 10 Kg SS	1 no. each
28.	Liquid filling machine	For filling liquid in bottles, 200 ml, 500 ml, 1000 ml. Manual	1 no. each
29.	SS filter	Sieve type cloth filter, hydraulic,	1 no.
30.	Sugar coating pan	SS, Revolving type with speed	1 no.
31.	Bottle opener	Heavy duty, Stainless Steel	4 nos.
32.	Burette	50 ml digital Automatic/ ordinary glass	2 nos.
33.	Pipette	5-50 ml capacities, glass	2 nos.
34.	Improved stoves	Made of MS with proper safety Measures, Valves etc	2 nos.
35.	Stainless steel / Aluminium pots	Different Capacities	As required
36.	Wooden spoons	Different sizes	As required
37.	Homogenizer		1 no.
38.	Juicer mixer grinder		2 nos.
39.	Baby Boiler/Diesel fuel/capacity of boiler as per capacity of steam jacket kettle.		1 no.
40.	Carbonation machines		1 no.
41.	Distillation Assembly		1 no.
42.	Soft drink making machines		1 no.
B: FURNITURE			
Class Room			
43.	Instructor Chair & Table		01 No
44.	Dual Desk		12 No.
Workshop / Lab			
45.	Suitable Work tables		04 No.

46.	Stools		24 No.
47.	Discussion Table		01 No.
48.	Tool Cabinet		01 No.
49.	Trainees Locker with space for 20		01 No.
50.	First Aid Box		01 No.
51.	Book Shelf (glass panel)		01 No.

Note: -

- 1. All the tools and equipment are to be procured as per BIS specification.*
- 2. Internet facility is desired to be provided in the class room.*
- 3. Raw material, Testing Chemicals and consumables are not included in the list.*

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Industry Member			
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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

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

