Syllabus For Fruit and Vegetable Pulp and Juice Processing Assistant

Course Name	**Fruit and Vegetable Pulp and Juice Processing Assistant**
Sector	Food Processing
Sub-Sector	Ripe Mango pulp processing, Ripe Banana Pulp processing, Tomato pulp processing, pumpkin pulp processing, Nectar, squash, cordial preparation, Sauce and Ketchup preparation, Jam, Jelly and Marmalade preparation, fruit syrup preparation
Course Code	FPT/2024/FVPA/278
Level	3
Occupation	Processing of Fruit and Vegetable Pulp and juice
Job Description	The Assistant is responsible for operating and maintaining equipment used in the production of fruit and vegetable pulp and juices. The duties will include assisting in activities like production processes, quality control checks, troubleshooting equipment issues and adherence to hygiene and safety standards
Course Duration	Total Duration 390 Hrs (T-90, P- 180, OJT-60 and ES-60)
Trainees' Entry Qualification	Grade 10 OR Grade 8 pass and pursuing continuous schooling in regular school with vocational subject OR 8th grade pass with 2 yrs relevant experience OR Previous relevant Qualification of NSQF Level 2 with one yr experience OR Previous relevant Qualification of NSQF Level 2.5 with 6 months experience
Trainers Qualification	Degree in Food Technology with One-year experience in relevant field/industry OR Diploma in Food Technology with two years' experience in relevant field/industry OR NTC/NAC passed in "Fruits and Vegetables Processing" trade with three years' experience in relevant field.

Structure of Course:

Module No.	Module name	Outcome	Theory (Hrs)	Practical (Hrs)	Total (Hrs)
1	**Overview of Food Processing Industry**	Explain roles and responsibilities of a Fruit and Vegetable Pulp and juice Processing Assistant in the sectoral industry	10	20	30
2	**Prepare and maintain work area**	Perform various tasks prior to production in the Fruit and Vegetable Pulp and juice Processing industry	10	20	30

Module No.	Module name	Outcome	Theory (Hrs)	Practical (Hrs)	Total (Hrs)
3	**Extraction and Clarification of Fruit and Vegetable Pulp and juice**	Extract and clarify Fruit and Vegetable Pulp and juice from a variety of fruits and vegetables	20	40	60
4	**Production of Nectar, squash, cordial and fruit syrup from various Fruits**	Make the production of Nectar, squash, cordial and fruit syrup using various machinery and tools	10	20	30
5	**Production of Jam, Jelly and Marmalade from various Fruits**	Prepare Jam, Jelly and Marmalade using various machinery and tools	10	20	30
6	**Production of Sauce, Ketchup, puree, paste various vegetables**	Perform production of Sauce, Ketchup, puree, paste using various machinery and tools as per the standards	10	20	30
7	**Finished Products packaging/labelling Procedure**	Demonstrate manual/ automatic packaging/ labelling operation of Fruits and Vegetables products	10	20	30
8	**Food safety hygiene and sanitation for Fruit and Vegetable Pulp and juice processing**	Implement Food safety hygiene and sanitation practices at the Fruit and Vegetable Pulp and juice processing workplace.	10	20	30
9	**OJT**	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).		60	60
10	**Employability Skill**	As per guided curriculum	60	--	60
		TOTAL	**150**	**240**	**390**

SYLLABUS:

Module 1: Overview of Food Processing Industry

Outcome: Explain roles and responsibilities of a Fruit and Vegetable Pulp and juice Processing Assistant in the sectoral industry

Theory Content:

1.1 Discuss about the food processing industry and Fruit and Vegetable Pulp and juice Processing sub-sector in brief.
1.2 Elaborate the career opportunities available to a Fruit and Vegetable Pulp and juice Processing Assistant in the food processing industry.
1.3 Explain the terminologies used Fruit and Vegetable Pulp and juice Processing.

1.4 List the sequence of operations to be performed in the job.
1.5 Outline roles and responsibilities and safety procedures in Fruit and Vegetable Pulp and juice Processing industry
1.6 State the food safety hygiene standards to follow in a work environment.

Practical Content:

1.1 Demonstrate category of Fruit and Vegetable Pulp and juice Processing sub-sector like Ripe Mango pulp processing, Ripe Banana Pulp processing, Tomato pulp processing, pumpkin pulp processing, Nectar, squash, cordial and fruit syrup preparation, Sauce, Ketchup, puree, paste preparation, Jam, Jelly and Marmalade preparation, preparation
1.2 Conduct the sequence of operations to be performed in the job.

Classroom Aids:
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook
Tools, Equipment and Other Requirements:
Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual, Fruit and Vegetable Pulp and juice Processing manual

Module 2: Prepare and maintain work area
Outcome: Perform various tasks prior to production in the Fruit and Vegetable Pulp and juice Processing industry
Theory Content:
2.1 Process of raw materials inspection and sorting. Equipment used in the cleaning and maintenance of the machineries for production of fruit and Vegetable Pulp and juice.
2.2 Procedure for cleaning and washing. Identify common detergents and sanitizers used in cleaning work area and machineries.
2.3 Pre-processing preparation.
2.4 Describe the methods of cleaning and sanitization of process machineries and equipment for production of fruit and Vegetable Pulp and juice.
2.5 Explain the method of maintenance of process machineries and equipments for production of fruit and Vegetable Pulp and juice before starting production.
2.7 Maintain good housekeeping practices in designated area for machineries and equipments for production of fruit and Vegetable Pulp and juice.
Practical Content:
2.1 List the materials and equipment used in cleaning and maintenance of the work area and process Machineries.
2.2 Identify the common detergents and sanitizers used in cleaning work area and machineries.
2.3 Demonstrate the appropriate method for cleaning and maintenance of work area to ensure the work area is safe and hygienic for production of fruit and Vegetable Pulp and juice.
2.4 Identify different equipment used in processing of fruit and Vegetable Pulp and juice.
2.5 Check the working condition of machineries and equipments used for canning of fruits and vegetables pulp and juice, extraction and clarification of pulp and juice.

Classroom Aids:
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook
Tools, Equipment and Other Requirements:
Washer, Peeler, Corer, Slicer, Steam Jacketed Kettles, Retort, Cutting Knives, Weighing Machine, Tray,

Cans, Brinometer, Salinometer , Refractometer, Thermometer, Sealer, Blancher, Different Types of Canned Packaging Material, Sterilizer, can reformer, can flanger, can seamer, juice extractor, fruits pulper, fruits crusher, Protective Gloves, Head Caps, Aprons, Safety Boots, Mouth Masks, Sanitizer, Safety Manual

Module 3: Extraction and Clarification of Fruit and Vegetable Pulp and juice

Outcome: Extract and clarify Fruit and Vegetable Pulp and juice from a variety of fruits and vegetables

Theory Content:

3.1 Describe method of washing of raw fruits and vegetables for remove dirt, soil, dust and unwanted sticky material etc.

3.2 Inspect and sort fruits visually and manually to remove damaged, blemished, and rotten fruits and vegetables.

3.3 Explain fruits and vegetables pulp and juice processing technique and equipments - sorting, grading, cleaning, crushing, pressing, Juice extraction, pulping, clarification (clarifying agents-physical, chemical, enzymic), filtration, deaeration, pasteurization, homogenization, preservation, packaging.

3.4 Illustrate operation of can reformer, flanger, seamer, can body beader, and embossing machines to form cans.

3.5 Elaborate canning process of fruits and vegetables pulp and juice.

3.6 Procedure for clarification process

Practical Content:

3.1 Receive fruits from the supplier/vendor and check weight, size, shape, colour etc.

3.2 Check quality of raw fruits and vegetables through physical parameters such as appearance, colour, texture, maturity etc.

3.3 Conduct washing of fruits and vegetables into the washing tank to remove dirt, soil, dust and unwanted sticky material,

3.4 Transfer fruits and vegetables from the washing tank to the washing line conveyor.

3.5 Inspect and sort fruits visually and manually to remove damaged, blemished, and rotten fruits and vegetables.

3.6 Remove the peel or core of the fruits.

3.7 Cut fruits manually in required size or load the fruits in the chopper/cutter/slicer machine.

3.8 Extract pulp or juice from fruits and vegetables using various machinery.

3.9 Filter and clarify pulp and juice in a clarifier.

3.10 Collect the refined pulp or juice in the collection tank.

3.11 Check collected pulp or juice to ensure if it is free from seeds and fibers.

3.12 Transfer measured quantity of pulp or juice from collection tank to steam jacketed kettle/ pre-cooking tank for cooking pulp

3.13 Examine pre-cooked fruits pulp or juice through feel/texture

3.14 Measure the brix of pulp or juice with the help of refractometer.

3.16 Collect the pre-cooked pulp or juice in the collection tank/ holding tank.

3.17 Take samples of the pulp or juice and transfer it to the quality lab for analysis of Brix, pH, titratable acidity etc.

3.18 Transfer measured quantity of pre-cooked pulp or juice into de-aeration tank to the de-aerate pulp.

3.19 Transfer measured quantity of de-aerated pulp or juice into continuous evaporator for concentrating the pulp or juice.

3.20 Transfer measured quantity of pre-cooked/de-aerated and concentrated pulp into sterilization tank to sterilize pulp before aseptic packing.

3.21 Operate can reformer, flanger, seamer, can body beader, and embossing machines to form cans

3.22 Feed empty cans by pulp or juice and then exhausting, sealing of can lid by machines.
3.23 Perform sterilization process of the cans and collect sterilized cans.
3.24 Cool the cans in cold water tank by operating the valves to circulate cold water in tanks and manually dry the cans.
3.25 Inspect the cans for leakage and remove the leaked cans from the water tank.
3.26 Transfer the filled and cooled cans to the packaging machine
3.27 Take samples of the canned product and send them to the quality lab for analysis.
3.28 Pack the labeled cans into cartons and transfer to the storage area and store them as per standard storage conditions.

Classroom Aids:
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook

Tools, Equipment and Other Requirements:
Washer, Peeler, Corer, Slicer, Steam Jacketed Kettles, Retort, Cutting Knives, Weighing Machine, Tray, Cans, Brinometer, Refractometer, Thermometer, Sealer, Blancher, Different Types of Canned Packaging Material, Sterilizer, can reformer, can flanger, can seamer, juice extractor, fruits pulper, fruits crusher, Protective Gloves, Head Caps, Aprons, Safety Boots, Mouth Masks, Sanitizer, Safety Manual

Module 4: Production of Nectar, squash, cordial and fruit syrup from various Fruits

Outcome: Make the production of Nectar, squash, cordial and fruit syrup using various machinery and tools

Theory Content:

4.1 Process flow-sheet of nectar (ripe mango, orange), fruit squash (green mango, ripe mango, pineapple), ready-to-serve beverages (bael, jamun), Lemon cordial from different fruit juice.
4.2 Types of process machineries and equipments used in production of production nectar, squash, cordial, RTS.
4.3 List ingredient required for production of nectar, squash, cordial and RTS.
4.4 Explain process of pasteurization, homogenization, preservation, packaging of nectar, squash, cordial and RTS.
4.5 Describe method of preparation of natural and synthetic fruits syrup.
4.6 Illustrate manufacturing technique of synthetic RTS beverage (litchi drinks), synthetic syrup (orange).
4.7 Explain FPO, FSSAI standard of nectar, squash, cordial, RTS and natural and synthetic fruits syrup.
4.8 Procedure to check the quality of nectar, squash, cordial, RTS and natural and synthetic fruits syrup (Determination of total soluble solids, fruit content, acidity, reducing and nonreducing sugar).

Practical Content:

4.1 Demonstrate the manufacturing Process of nectar (ripe mango, orange), fruit squash (green mango, ripe mango, pineapple), ready-to-serve beverages (bael, jamun), Lemon cordial from different fruit juice.
4.2 Demonstrate the operation of machineries and equipments used in production of production nectar, squash, cordial, RTS.
4.3 Identify ingredient required for production of nectar, squash, cordial, RTS.
4.4 Conduct pasteurization, homogenization, preservation, packaging of nectar, squash, cordial, RTS.

4.5 Demonstrate manufacturing technique of synthetic RTS beverage (litchi drinks), synthetic syrup (orange).

4.6 Ensure FPO, FSSAI standard of nectar, squash, cordial, RTS and natural and synthetic fruits syrup.

4.7 Examine quality of nectar, squash, cordial, RTS and natural and synthetic fruits syrup (Determination of total soluble solids, fruit content, acidity, reducing and nonreducing sugar).

4.8 Clean the work area, machineries, equipment and tools using approved cleaning agents and Sanitizers after production.

Classroom Aids:

Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook

Tools, Equipment and Other Requirements:

Digital weight balance, Washer, Peeler, Corer, Slicer, Retort, Cutting Knives, Weighing Machine, Tray, Cans, Refractometer, Thermometer, juice extractor, fruits pulper, fruits crusher, Protective Gloves, Head Caps, Aprons, Safety Boots, Mouth Masks, Sanitizer, Safety Manual

Module 5: Production of Jam, Jelly and Marmalade from various Fruits

Outcome: Prepare Jam, Jelly and Marmalade using various machinery and tools

Theory Content:

5.1 Differentiate jam, jellies, marmalades with specifications.

5.2 Highlight role of pectin, source and functional properties of pectin, grades of pectin.

5.3 Describe method of Preparation of guava jam, ripe mango jam - ingredients, process flow-sheet, process description, machineries, judging of end point and FSSAI standards.

5.4 Outline Problem in jam making (sticks or gummy jam, premature setting, surface graining, shrinkage, mold growth).

5.5 Describe method of Preparation of guava jelly, pineapple jelly- ingredients, process flow-sheet, process description, machineries, cooking of jelly, judging of end point and FSSAI standards.

5.6 Describe method of Preparation of orange marmalade- ingredients, process flow-sheet, process description, machineries, judging of end point and FSSAI standards.

Practical Content:

5.1 Receive fruits from the supplier/vendor and check weight, size, shape, colour etc.

5.2 Check quality of raw fruits and vegetables through physical parameters such as appearance, colour, texture, maturity, etc

5.3 Conduct washing of fruits and vegetables into the washing tank to remove dirt, soil, dust and unwanted sticky material.

5.4 Conduct pectin test of raw fruit juice or pulp.

5.5 Demonstrate method of Preparation of guava jam, ripe mango jam - ingredients, process flow-sheet, process description, machineries, judging of end point and FSSAI standards.

5.6 Identify Problem associated in jam making (sticks or gummy jam, premature setting, surface graining, shrinkage, mold growth).

5.7 Demonstrate method of Preparation of guava jelly, pineapple jelly- ingredients, process flow-sheet, process description, machineries, cooking of jelly, judging of end point and FSSAI standards.

5.8 Identify Problem associated in jelly making (failure to set, cloudy jelly, syneresis, crystals formation).

5.9 Demonstrate method of Preparation of orange marmalade- ingredients, process flow-sheet, process description, machineries, judging of end point and FSSAI standards.

5.10 Examine quality of jam, jellies, marmalades (Determination of total soluble solids, fruit content, preservatives, total ash, moisture, reducing and nonreducing sugar).

Classroom Aids:
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook
Tools, Equipment and Other Requirements:
Digital weight balance, Washer, Peeler, Corer, Slicer, Steam Jacketed Kettles, Retort, Cutting Knives, Weighing Machine, Tray, Cans, Brinometer, Refractometer, Thermometer, Sealer, juice extractor, fruits pulper, fruits crusher, Protective Gloves, Head Caps, Aprons, Safety Boots, Mouth Masks, Sanitizer, Safety Manual

Module 6: Production of Sauce, Ketchup, puree, paste various vegetables

Outcome: Perform the production of Sauce, Ketchup, puree, paste using various machinery and tools as per the standards
Theory Content:

6.1 Check the quality of Tomato, its types, variety colour, pigment.
6.2 Describe Extraction process of tomato juice, Hot pulping process, Cold pulping process, Advantages of Hot pulping process.
6.3 Discuss Manufacturing process of different tomato products (tomato juice, tomato paste, tomato puree, tomato ketchup, tomato sauce) -ingredients, process flow-sheet, process description, machineries, judging of end point and FSSAI standards.
6.4 Problems associate in tomato product processing (separation of layers, molding of the juice, fermentation of juice, Sourness of tomato juice, black neck formation), prevention and control of defect.
6.5 Determine the quality of tomato products (Determination of total soluble solids, acidity, preservative).

Practical Content:
6.1 Inspect and check the quality of fruits received from the supplier/vendor and check weight, size, shape, colour of tomato.
6.2 Check quality of raw tomato through physical parameters such as appearance, colour, texture, maturity, etc
6.3 Conduct washing of fruits and vegetables into the washing tank to remove dirt, soil, dust and unwanted sticky material.
6.4 Identify ingredients used in manufacturing of different tomato products (tomato juice, tomato paste, tomato puree, tomato ketchup, tomato sauce).
6.5 Demonstrate Manufacturing process of different tomato products (tomato juice, tomato paste, tomato puree, tomato ketchup, tomato sauce)
6.6 Demonstrate the operation of machineries and equipments used in production of tomato products.
6.7 Maintain HACCP and FSSAI standard during production of tomato products.
6.8 Identify Problems associate in tomato product processing (separation of layers, molding of the juice, fermentation of juice, Sourness of tomato juice, black neck formation).
6.9 Examine quality of tomato products (Determination of total soluble solids, acidity, preservative).

Classroom Aids:
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook
Tools, Equipment and Other Requirements:

Washer, Peeler, Corer, Slicer, Steam Jacketed Kettles, Retort, Cutting Knives, Weighing Machine, Tray, Cans, Brinometer, Refractometer, Thermometer, Sealer, Blancher, Different Types of Canned Packaging Material, Sterilizer, can reformer, can flanger, can seamer, fruits pulper, fruits crusher, Protective Gloves, Head Caps, Aprons, Safety Boots, Mouth Masks, Sanitizer, Safety Manual

Module 7: Finished Products packaging/labelling procedure

Outcome: Demonstrate manual/automatic packaging/labelling operation of Fruits and Vegetables products

Theory Content:

7.1 Basic functions of packaging; Different forms of packaging - Rigid, semirigid, flexible, Primary, secondary and tertiary.

7.2 Primary Packaging Materials (Paper and paper-based packaging materials, glass, metal can, Plastic as packaging materials)

7.3 Explain Secondary Packaging Material and Transport packaging materials.

7.4 Describe Ancillary Packaging Materials (Printing inks, varnishes, and adhesives)

7.5 Different types of packaging materials – Polymer, paper, metal, glass-merits and demerits and uses.

7.6 Can manufacturing process of glass and metal

7.7 Polymeric materials, their mechanical sealing: Polyamides, Polyesters, PVC, PVDC, PVA, Copolymers, Polycarbonates.

7.8 Packaging equipment's – Form-fill-seal machine (Horizontal and vertical), Filling equipment's, Sealing machine. labelling equipment's.

7.9 Various Labelling operations

7.10 Quality control and Adaptability to product varieties.

Practical Content:

7.1 Identify appropriate primary and secondary packaging material for specific products.

7.2 Load packing materials in packaging/bagging machine and set packing quantity, set date coding machine for date code details like batch number, date of manufacture, date of expiry etc.

7.3 Demonstrate automatic packaging machine to fill and seal (or) form, fill and seal measured quantity of finished tomato products.

7.4 Check weight of packed/container product periodically to ensure its conformance to standards.

7.5 Sample packed product and transfer to quality lab for analysis and to ensure its conformance to quality Standards.

7.6 Place packed and labelled products in cartons/other secondary packaging material and seal, transfer to storage area and store.

7.7 Clean the packaging area, packaging machineries, equipment and tools using recommended cleaning agents and sanitizers.

7.8 Demonstrate the procedure of labeling operations

7.9 Inspect the product for defects, ensuring packaging integrity and verifying the accuracy of labels.

7.10 Document and maintain records on the finished products details like batch number, time of packing, date of manufacture, date of expiry, other label details, primary, secondary and tertiary packaging materials for all finished products, storage conditions etc., as per organization standards.

Classroom Aids:

Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook

Tools, Equipment and Other Requirements

Different Types of Packaging Material, Conveyor, Hopper, Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Safety Manual, Packing Rolls, pouch Packing Machine, Vacuum Packing Machine, Labeler, Sealer, Wrapping Machine, Form-fill-seal machine (Horizontal and

vertical), Filling equipment's, Sealing machine. Different Types of Canned Packaging Material, Sterilizer, can reformer, can flanger, can seamer, juice extractor, fruits pulper, fruits crusher,, labelling equipment's.

Module 8: Food safety hygiene and sanitation for Fruit and Vegetable Pulp and juice processing

Outcome: Implement Food safety hygiene and sanitation practices at the Fruit and Vegetable Pulp and juice processing workplace

Theory Content:

8.1 Define hazards and risks.
8.2 Identify the various types of health and safety equipment available in an organization and the methods for obtaining them.
8.3 Elaborate the industry standards to maintain a safe and hygiene workplace.
8.4 Explain HACCP principles to eliminate food safety hazards in the process and products.
8.5 Highlight safety practices in the work area.
8.6 Outline FPO and FSSAI standard for Fruit and Vegetable Pulp and juice Processing
8.7 Comply with food safety and hygiene procedures followed in the organization.
8.8 Ensure hygienic production of food by inspecting raw materials, ingredients, finished products, etc. for compliance to physical, chemical and microbiological parameters.
8.9 Pack products in appropriate packaging materials, label and store them in designated area, free from pests, flies and infestations.
8.10 Follow industry standards like GMP and HACCP and product recall process.
8.11 Highlight the organizational health and safety policies and procedures.
8.12 State the importance of safety, hygiene and sanitation in the food industry.
8.13 Highlight the importance of sanitizing self and the work area safely and appropriately.

Practical Content:

8.1 Ensure personal hygiene by using of gloves, hairnets, masks, ear plugs, shoes, etc.
8.2 Conduct hygienic production of food by inspecting raw materials, ingredients, finished products, etc. for compliance to physical, chemical and microbiological parameters.
8.3 Clean maintain and monitor food processing equipment periodically, using it only for specified purpose.
8.4 Apply housekeeping practices by having designated area for materials/tools.
8.5 Apply the industry standards to maintain a safe and hygiene workplace.
8.6 Apply GMP and HACCP principles to eliminate food safety hazards in the process and products.
8.7 Follow safety practices in the work area.
8.8 Maintain raw material, packaging material, process and finished products

Classroom Aids:

Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook

Tools, Equipment and Other Requirements

Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual, Fruit and Vegetable Pulp and juice standard manual.

Module 9 : OJT

Outcome: Work in real job situation with special emphasis on basic safety and hazards in this domain

Practical Content:

Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain. (The trainee is expected to undertake work in actual workplace under any supervisor / contractor for **60 Hours.**)

Module 10 : Employability Skills **(60 Hrs)**

Key Learning Outcomes

Introduction to Employability Skills Duration: 1.5 Hours

After completing this programme, participants will be able to:

1. Discuss the Employability Skills required for jobs in various industries
2. List different learning and employability related GOI and private portals and their usage

Constitutional values - Citizenship Duration: 1.5 Hours

3. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen
4. Show how to practice different environmentally sustainable practices.

Becoming a Professional in the 21st Century Duration: 2.5 Hours

5. Discuss importance of relevant 21st century skills.
6. Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life.
7. Describe the benefits of continuous learning.

Basic English Skills Duration: 10 Hours

8. Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone
9. Read and interpret text written in basic English
10. Write a short note/paragraph / letter/e -mail using basic English

Career Development & Goal Setting Duration: 2 Hours

11. Create a career development plan with well-defined short- and long-term goals

Communication Skills Duration: 5 Hours

12. Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette.
13. Explain the importance of active listening for effective communication
14. Discuss the significance of working collaboratively with others in a team

Diversity & Inclusion Duration: 2.5 Hours

15. Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD
16. Discuss the significance of escalating sexual harassment issues as per POSH act.

Financial and Legal Literacy Duration:5 Hours

17. Outline the importance of selecting the right financial institution, product, and service
18. Demonstrate how to carry out offline and online financial transactions, safely and securely

19. List the common components of salary and compute income, expenditure, taxes, investments etc.
20. Discuss the legal rights, laws, and aids

Essential Digital Skills Duration: 10 Hours

21. Describe the role of digital technology in today's life
22. Demonstrate how to operate digital devices and use the associated applications and features, safely and securely
23. Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely
24. Create sample word documents, excel sheets and presentations using basic features
25. utilize virtual collaboration tools to work effectively

Entrepreneurship Duration: 7 Hours

26. Explain the types of entrepreneurship and enterprises
27. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan
28. Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement
29. Create a sample business plan, for the selected business opportunity

Customer Service Duration: 5 Hours

30. Describe the significance of analyzing different types and needs of customers
31. Explain the significance of identifying customer needs and responding to them in a professional manner.
32. Discuss the significance of maintaining hygiene and dressing appropriately

Getting Ready for apprenticeship & Jobs Duration: 8 Hours

33. Create a professional Curriculum Vitae (CV)
34. Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively
35. Discuss the significance of maintaining hygiene and confidence during an interview
36. Perform a mock interview
37. List the steps for searching and registering for apprenticeship opportunities
38.

Learning Outcome – Assessment Criteria

Module No.	Outcome	Assessment Criteria
1	Explain roles and responsibilities of a Fruit and Vegetable Pulp and juice Processing Assistant in the sectoral industry	**After completion of this module students will be able to:** 1.1 Demonstrate category of Fruit and Vegetable Pulp and juice Processing sub-sector 1.2 Conduct the sequence of operations to be performed in the job. 1.3 Determine the terminologies used Fruit and Vegetable Pulp and juice Processing. 1.4 Evaluate job opportunities in different Fruit and Vegetable Pulp and juice Processing sub-sector. 1.7 Describe the roles and responsibilities of Fruit and Vegetable Pulp and Juice Processing Assistant
2	Perform various tasks prior to production in the Fruit and Vegetable Pulp and juice Processing industry	**After completion of this module students will be able to:** 2.1 List out the materials and equipment used in cleaning and maintenance of the work area and process Machineries. 2.2 Identify and select the common detergents and sanitizers used in cleaning work area and machineries. 2.3 Demonstrate the appropriate method for cleaning and maintenance of work area 2.4 Identify different equipment used in processing of fruit and Vegetable Pulp and juice. 2.5 Check the performance of the machineries and equipment's used for canning of fruits and vegetables pulp and juice, extraction and clarification of pulp and juice.
3	Extract and clarify Fruit and Vegetable Pulp and juice from a variety of fruits and vegetables	**After completion of this module students will be able to:** 3.1 Check the quality of raw fruits and vegetables through physical parameters such as appearance, colour, texture, maturity etc. 3.2 Wash the fruits and vegetables into the washing tank to remove dirt, soil, dust and unwanted sticky material, 3.3 Transfer fruits and vegetables from the washing tank to the washing line conveyor. 3.4 Inspect and sort fruits visually and manually to remove damaged, blemished, and rotten fruits and vegetables. 3.5 Remove the peel or core of the fruits. 3.6 Cut the fruits manually in required size or load the fruits in the chopper/cutter/slicer machine. 3.7 Extract pulp or juice from fruits and vegetables using appropriate machinery. 3.8 Filter and clarify pulp and juice in a clarifier.

Module No.	Outcome	Assessment Criteria
		3.9 Collect the refined pulp or juice in the collection tank. 3.10 Examine pre-cooked fruits pulp or juice through feel/texture 3.11 Measure the brix of pulp or juice with the help of refractometer. 3.12 Take samples of the pulp or juice and transfer it to the quality lab for analysis of Brix, pH, titratable acidity, etc. 3.13 Transfer measured quantity of de-aerated pulp or juice into continuous evaporator for concentrating the pulp or juice. 3.14 Transfer measured quantity of pre-cooked/de-aerated and concentrated pulp into sterilization tank to sterilize pulp before aseptic packing. 3.15 Feed empty cans by pulp or juice and then exhausting, sealing of can lid by machines. 3.16 Perform sterilization process of the cans and collect sterilized cans. 3.17 Cool the cans in cold water tank by operating the valves to circulate cold water in tanks and manually dry the cans. 3.18 Inspect the cans for leakage and remove the leaked cans from the water tank. 3.19 Transfer the filled and cooled cans to the packaging machine 3.20 Pack the labeled cans into cartons and transfer to the storage area and store them as per standard storage conditions.
4	Make the production of Nectar, squash, cordial and fruit syrup using various machinery and tools	**After completion of this module students will be able to:** 4.1 Demonstrate the manufacturing Process of nectar (ripe mango, orange), fruit squash (green mango, ripe mango, pineapple), ready-to-serve beverages (bael, jamun), Lemon cordial from different fruit juice. 4.2 Demonstrate the operation of machineries and equipment's used in production of production nectar, squash, cordial, RTS. 4.3 Identify ingredient required for production of nectar, squash, cordial, RTS. 4.4 Conduct pasteurization, homogenization, preservation, packaging of nectar, squash, cordial, RTS. 4.5 Demonstrate manufacturing technique of synthetic RTS beverage (litchi drinks), synthetic syrup (orange). 4.6 Examine quality of nectar, squash, cordial, RTS and natural and synthetic fruits syrup (Determination of total

Module No.	Outcome	Assessment Criteria
		soluble solids, fruit content, acidity, reducing and nonreducing sugar). 4.7 Clean the work area, machineries, equipment and tools using approved cleaning agents and sanitize the area.
5	Prepare Jam, Jelly and Marmalade using various machinery and tools	5.1 Check quality of raw fruits and vegetables through physical parameters 5.2 Wash the fruits and vegetables into the washing tank to remove dirt, soil, dust and unwanted sticky material. 5.3 Conduct pectin test of raw fruit juice or pulp. 5.4 Follow the procedure to prepare of guava jam, ripe mango jam 5.5 Identify Problem associated in jam making (sticks or gummy jam, premature setting, surface graining, shrinkage, mold growth). 5.6 Demonstrate method of Preparation of guava jelly, pineapple jelly 5.7 Identify Problem associated in jelly making (failure to set, cloudy jelly, syneresis, crystals formation). 5.8 Demonstrate method of Preparation of orange marmalade 5.9 Examine the quality of jam, jellies, marmalades
6	Perform production of Sauce, Ketchup, puree, paste using various machinery and tools as per the standards	6.1 Receive fruits from the supplier/vendor and check weight, size, shape, colour of tomato. 6.2 Check quality of raw tomato. 6.3 Wash fruits and vegetables into the washing tank to remove dirt, soil, dust and unwanted sticky material. 6.4 Identify ingredients used in manufacturing of different tomato products (tomato juice, tomato paste, tomato puree, tomato ketchup, tomato sauce). 6.5 Demonstrate the operation of machineries and equipment's used in production of tomato products. 6.6 Identify Problems associate in tomato product processing (separation of layers, molding of the juice, fermentation of juice, Sourness of tomato juice, black neck formation). 6.7 Take preventive measures and control defect in tomato product. 6.8 Examine quality of tomato products (Determination of total soluble solids, acidity, preservative).
7	Demonstrate manual/ automatic / packaging / labelling operation of Fruits and Vegetables products	7.1 Identify appropriate primary and secondary packaging material as per products. 7.2 Load packing materials in packaging/bagging machine and set packing quantity 7.3 Start automatic packaging machine to fill and seal (or) form, fill and seal measured quantity of finished tomato products. 7.4 Check weight of packed/container product periodically to ensure its conformance to standards. 7.5 Place packed and labelled products in cartons/other secondary packaging material and seal, transfer to storage area and store. 7.6 Clean the packaging area, packaging machineries, equipment and tools using recommended cleaning agents and sanitizers. 7.7 Complete the documentation process.

Module No.	Outcome	Assessment Criteria
8	Implement Food safety hygiene and sanitation practices at the Fruit and Vegetable Pulp and juice processing workplace	8.1 Maintain personal hygiene by using of gloves, hairnets, masks, ear plugs, shoes, etc. 8.2 Conduct hygienic production of food by inspecting raw materials, ingredients, finished products, etc. for compliance to physical, chemical and microbiological parameters. 8.3 Clean maintain and monitor food processing equipment periodically, using it only for specified purpose. 8.4 Apply GMP and HACCP principles to eliminate food safety hazards in the process and products. 8.5 Apply safety practices in the work area.
9	OJT	Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain. (The trainee is expected to undertake work in actual workplace under any supervisor / contractor for 60 Hours.)
10	Employability Skill	As per guided curriculum

List of Tools, Equipment & materials needed for 30 Trainees (Practical)

Sl No	Items Name	Specification	Qty
1	Hot air oven (18''×18''×24'') inch size	Hot air oven (18''×18''×24'') with blower digital temp (Multispan) and time control, inside made of 304SS of 20gage, outside of MS with powder coated finish, ball catcher heavy door. Three side heating elements, Standard double wall fabrication, Inner chamber made of highly polished stainless steel sheet, Exterior fabricated out of thick mild steel duly finished in white stoving enamel with mat finished colour combinations, Quick and uniform heating in range of 50°C to 250°C ±2°C controlled by capillary type thermostat, L-shaped thermometer is built-in type, Control panel is provided with selector switch (Maltispan) of high or low rates of power thermostat control knob and indicators for mains & thermostat.	1 no
2	Digital pH Meter, Range : 0 to 14pH	Digital bench top pH Meter, Range : 0 to 14pH (mV upto 1999mV), Resolution : 0.01pH (±1mV), Accuracy : 0.01pH, ±1 digit (1mV, ±1digit), Temperature compensation : 0°C to 100°C (manual), 7	1 no

Sl No	Items Name	Specification	Qty
		segment 3.5 Digit Green LED Display with automatic polarity and decimal indications, With one combination electrode, stand, clamp, buffers, dust cover & operation manual. Manual calibration by adjust of knob with buffer facility. The electrode is a glass body, refillable, single junction pH electrode with a DIN connector. This electrode has a single ceramic junction in the outer reference cell and the pH sensing portion is made with general purpose glass. This pre-amplified electrode features a built-in temperature sensor for temperature compensated measurements in a single probe design. This design consideration is ideal for laboratory and general purpose use. Supply with pH 4.01 buffer, pH 7.00 buffer pH 9.2 buffer capsule box of each pH.	
3	Physical rough balance Capacity=30 Kg	Physical rough balance, Table Top Balance Capacity: 30 Kg Readability: 1g Linearity: 2g Repeatability: 1g Power Supply: 220V + 10 V AC Pan Size: 250×330mm Frequency: 50 Hz Rust proof Stainless Steel body and pan Battery Back Up To 60 Hours Powder Coated & Robust Structure to suit rough environmental Conditions Overload Protection Low Battery Alarm Indication	3 no
4	Gas oven	Design: Gas oven Colour: Silver Material: Stainless Steel Special Feature: Manual Ignition Heating Elements 2 burner Material: Top-quality stainless steel material with a glossy finish that ensures	4 no

Sl No	Items Name	Specification	Qty
		the durability and longevity of the product. Burners: Equipped with two high-efficiency brass burners (1 Big and 1 Small) that ensure uniform distribution of heat on the utensils. Heavy-duty Pan Supports - The pan supports are designed to accommodate all major sizes of pans as it is reliable and rigid in construction. Knobs: Ergonomic and safe-handling knobs not only offers beauty & safety but also grants easy and quick access to lit the stove.	
5	Canning retort, double wall insulation, electrically operated	Canning retort, double wall insulation, electrically operated, vertical, double wall type, inner body made of 16-gauge SS 304 and outer body made of AISI Stainless Steel 304 Quality of 20gauge. Heating load of 4 KW approx. (whichever required) Capacity= 20 nos. 401 can at a time. With pressure gauge, safety valve, pressure control switch, Digital temperature controller display, pressure auto cut off system at 15 to 30 psi pressure. 304SS of perforated Basket with handle. Retort have central out let at the bottom.	1 no
6	Sterilization tank, laboratory mode	Sterilization tank, laboratory model, Inner chamber made of highly polished 304 AISI stainless steel sheet of 16 gauge and outer chamber made of highly polished 304 AISI stainless steel sheet of 20 gauge, SELEC/Multispan digital temp controller. Electrically operated, Heating load-3kw, capacity 20 no 401 cans at a time. Supply with 304SS of perforated Basket of size (24” x 30”) with handle and Perforated 304SS tray with stand over immersion heater.	1 no

Sl No	Items Name	Specification	Qty
7	Mixer grinder	Mixer grinder,600watt. Any reputed branded made	1 no
8	Potato Slicer, hand operated laboratory	Potato Slicer, hand operated laboratory model With thickness adjustment system, totally made of AISI Stainless Steel 304 Quality of 20gauge fitted with iron stand.	1 no
9	Electric Heater	Electric Heater, 2000W, coil type (nichrome wire), ceramic body.	1 no
10	Blanching Unit (SS made) with steam charging. lab model	Blanching Unit (SS made) with steam charging, laboratory model, Inner chamber made of highly polished 304 AISI stainless steel sheet of 16 gauge and outer chamber made of highly polished 304 AISI stainless steel sheet of 20 gauge, SELEC/Multispan digital temp controller. Electrically operated, Heating load-3kw, capacity 20 no 401 cans at a time. Supply with 304SS of perforated Basket of size (24" x 30") with handle and Perforated 304SS tray with stand over immersion heater.	1 no
11	SS stand Cutting table, size 5'x3'	304 SS solid stand Cutting table, size 5'x3', having SS304 of 14-gauge top and bottom cover, height 2.5ft, all legs made by SS tube.	1 no
12	Potato Slicer, ½ HP motor operated	Potato Slicer, ½ HP Compton motor operated laboratory model With thickness adjustment system, totally made of AISI Stainless Steel 304 Quality of 20gauge.	1 no
13	Electrically operated kettle type boiling Vat	Electrically operated kettle type for making tomato ketchup boiling 8-10 capacity Vat, MOC: 304SS type 2.5mm thick sheet, pressure gauge, safety valve and necessary fitting, heater capacity of 6Kw , 304SS materials make agitator, operated by 1.0 HP Compton motor. digital vat temp (SELEC/Multispan), glycerin Pressure Gauge and digital agitator speed controller cum indicator (SELEC/Multispan) with separate panel.	1 no
14	Screw type juice extractor	Screw type juice extractor, made 304SS	1 no

Sl No	Items Name	Specification	Qty
		laboratory model, ½ HP motor operated Compton make, fixed in a base.	
15	Vegetable Slicer, hand operated laboratory model	Vegetable Slicer, ½ HP Compton motor operated laboratory model with thickness adjustment system, totally made of AISI Stainless Steel 304 Quality of 20gauge.	1 no
16	Potato Slicer, hand operated laboratory	Potato Slicer, hand operated laboratory model With thickness adjustment system, totally made of AISI Stainless Steel 304 Quality of 20gauge fitted with iron stand.	1 no
17	Computer	Computer	1 no
18	White board	white board,	1 no
19	Marker		6 nos
20	Chart papers		2 nos
21	Projector		1 no
22	Trainer's guide		1 no
23	Aprons	Standard	30 nos
24	Ear plugs	Ear Plugs	30 nos
25	Eye and facial protection	Eye and Facial Protection	30 nos
26	Muffs		30 nos
27	Head-wear		30 nos
28	Hand gloves		30 nos
29	Lifting assistance	Lifting Assistance	2 nos
30	Mesh Aprons	Mesh Aprons	30 nos
31	Protective Boot Cover	Protective Boot Cover	30 nos
32	Protective Hand and Arm Covering	Protective Hand And Arm Covering	30 nos
33	Protective Head and; Hair Cover	Protective Head And; Hair Cover	30 nos
34	Uniforms	Uniforms	30 nos
35	Waterproof Footwear,	Waterproof Footwear,	30 nos
36	Containers	Containers	12 nos
37	Hand Tools	Hand Tools	12 nos
38	Lifting Aids	Lifting Aids	6 nos
39	Stacking Equipment	Stacking Equipment	2 nos
40	Conveyor,	Conveyor,	1 no
41	Processing Belts	Processing Belts	1 no
42	Fire Extinguishers	Fire Extinguishers	2 nos
43	Fire Alarm	Fire Alarm	2 nos
44	First Aid Equipment	First Aid Equipment	3 nos
45	Safety Instruments	Safety Instruments	3 nos
46	Clothing	Clothing	12 nos
47	Cotton	Cotton	6 nos
48	Rescue Equipment's	Rescue Equipment's	1 no
49	Mouth Masks	Mouth Masks	60 nos
50	Sanitizer	Sanitizer	6 nos

Sl No	Items Name	Specification	Qty
51	Detergent	Detergent	6 nos
52	Cleaning Agent	Cleaning Agent	6 nos
53	Gass oven	Gass oven	1 no
54	Dekchi,2 lit,SS	Dekchi,2 lit, made by high quality heavy gauge low carbon food grade steel	3 nos
55	Dekchi,5 lit,SS	Dekchi,5 lit, made by high quality heavy gauge low carbon food grade steel	3 nos
56	Dekchi,8 lit,SS	Dekchi,8 lit, made by high quality heavy gauge low carbon food grade steel	3 nos
57	Dekchi,10 lit,SS	Dekchi,10 lit, made by high quality heavy gauge low carbon food grade steel	3 nos
58	Dekchi,20 lit,SS	Dekchi,20 lit, made by high quality heavy gauge low carbon food grade steel	3 nos
59	Gamla 2lit SS	Gamla ,2 lit, made by high quality heavy gauge low carbon food grade steel	3 nos
60	Gamla 3lit SS	Gamla ,3 lit, made by high quality heavy gauge low carbon food grade steel	3 nos
61	Gamla 5 lit SS	Gamla ,5 lit, made by high quality heavy gauge low carbon food grade steel	3 nos
62	Gamla 10lit SS	Gamla ,10 lit, made by high quality heavy gauge low carbon food grade steel	3 nos
63	Plastic bucket, 9lit	Plastic bucket, 9lit, heavy gauge nylon made	3 nos
64	Plastic bucket, 11lit	Plastic bucket, 11lit, heavy gauge nylon made	3 nos
65	Plastic bucket, 15lit	Plastic bucket, 15lit, heavy gauge nylon made	3 nos
66	Plastic bucket, 20lit	Plastic bucket, 20lit, heavy gauge nylon made	3 nos
67	Cooking pan 3 lit	Cooking pan 3 lit, made by high quality heavy gauge low carbon food grade steel	3 nos
68	Cooking pan 5 lit	Cooking pan 5 lit, made by high quality heavy gauge low carbon food grade steel	3 nos
69	Cutting knife, small size	Cutting knife made of high-quality steel, manual	3 nos
70	Cutting knife, medium size	Cutting knife made of high-quality steel	3 nos

Marks Distribution

Outcome	Outcome Code	Total Th marks	Total Pr marks	Total OJT marks
Explain roles and responsibilities of a Fruit and Vegetable Pulp and juice Processing Assistant in the sectoral industry	FPT/1109/OC1	10	80	0
Perform various tasks prior to production in the Fruit and Vegetable Pulp and juice Processing industry	FPT/1109/OC2	20	80	0
Extract and clarify Fruit and Vegetable Pulp and juice from a variety of fruits and vegetables	FPT/1109/OC3	20	90	0
Make the production of Nectar, squash, cordial and fruit syrup using various machinery and tools	FPT/1109/OC4	20	80	0
Prepare Jam, Jelly and Marmalade using various machinery and tools	FPT/1109/OC5	20	80	0
Perform production of Sauce, Ketchup, puree, paste using various machinery and tools as per the standards	FPT/1109/OC6	20	80	0
Demonstrate manual/ automatic packaging/ labelling operation of Fruits and Vegetables products	FPT/1109/OC7	20	80	0
Implement Food safety hygiene and sanitation practices at the Fruit and Vegetable Pulp and juice processing workplace.	FPT/1109/OC8	20	80	0
Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	FPT/1109/OC9	0	0	150
Employability Skills – 60 Hrs	DGT/VSQ/N0102	50	0	0