Syllabus for Spices, herbs and condiments Processing Technician

Course Name	Spices, herbs and condiments Processing Technician
Sector	Food Processing
Course Code	FPT/2023/SHPT/170
Level	3
Occupation	Spices, herbs and condiments Processing Technician
Job Description	Spices, Herbs and Condiments Processing Technician is responsible for operating and overseeing the machinery and equipment used in the processing and production of spices, herbs and condiments. They are proficient in various processing techniques, including cleaning, drying, grinding, blending and packaging, ensuring the production of high-quality products that meet industry standards. They follow safety protocols, maintain cleanliness and hygiene in the processing area and adhere to regulatory and company guidelines.
Course Duration	Total Duration 390 Hrs (T-90, P-180, OJT-60 and ES-60)
Trainees' Entry Qualification	Grade 10 OR Grade 8 with two year of (NTC/ NAC) after 8th 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	BE BTECH IN FOOD TECHNOLOGY/ BE BTECH IN FOOD TECH AND BIO CHEMICAL ENGG/ B.SC HONS IN FOOD AND NUTRITION/ DIPLOMA IN FOOD PROCESSING/ ITI IN FOOD AND BEVERAGE TRADET/B.SC IN HOME SCIENCE 2 YRS FOR BE/BTECH/DEGREE IN HOTEL MANAGEMENT, 3 YRS FOR DIPLOMA/ B.SC, 3 YRS FOR ITI

Structure of Course:

Module No.	Module name	Outcome	Theory (Hrs)	Practical (Hrs)	Total (Hrs) [Multiple of 30]
1	Introduction to Spices, herbs condiments, Oleoresins and essential oils	Describe the Spices, herbs, condiments, Oleoresins and essential oils in brief	30	60	90
2	Prepare for spice production	Explain the standard practices to be followed by a Spices, herbs and condiments Processing Technician for planning the production	20	40	60

3	Production of whole spices, seasonings, spice powder and curry powder	Demonstrate the standard work practices followed to produce whole spices, seasonings, spice powder and curry powder	20	40	60
4	Packaging, Wrap, label and post production maintenance of equipment	Explain the procedure of wrapping and labelling of products and post production cleaning and maintenance of equipment	20	40	60
5.	OJT	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).		60	60
6.	Employability Skill	As per NCVET guided curriculum	60	--	60
		TOTAL:	150	240	390

SYLLABUS:

Module No. 1: Introduction to Spices, herbs condiments, Oleoresins and essential oils

Outcome: Describe the Spices, herbs, condiments, Oleoresins and essential oils in brief

Theory Content:

1.1 Define Spices, condiments, seasonings and culinary herbs;
1.2 Explain common parts use as Spices and Herbs,
1.3 Explain Role of spices and herbs in food processing,
1.4 Classify spices and herbs and beneficial properties of spices.
1.5 State Medicinal usage of some therapeutic active spices along with their active components such as turmeric (curcumin), black pepper (piperine), cardamom (1,8-cineole), coriander (linalool), cumin (cuminaldehyde), ginger (zingiberene), cinnamon (cinnamaldehyde), red chili (capsaicin), clove (eugenol), garlic (allicin).
1.6 Discuss on Different types of condiment and herb products along with their application.
1.7 Discuss the method of manufacturing of Oleoresins and essential oils (solvent extraction of oleoresins and steam distillation of essential oils).
1.8 Summarise the key role and responsibilities of 'Spice Processing Technician'.
1.9 List the various terminologies used in the spice processing industry.
1.10 Discuss the organisational policies to be followed pertaining to the delivery standards, health, safety and hazard handling procedures, integrity, dress code, etc.
1.11 State the importance of planning before starting the work.

Practical Content:

1.1 Classify biomass Spices, condiments, seasonings and culinary herbs;

1.2 Identify common parts use as Spices and Herbs,
1.3 Identify properties and characteristics of Spices and Herbs,

1.4 Identify Medicinal usage of some therapeutic active spices along with their active components.
1.5 Identify Different types of condiment and herb products along with their application.
1.6 Utilize beneficial properties of spices.
1.7 Demonstrate solvent extraction method of oleoresins
1.8 Demonstrate steam distillation method of essential oils

Module No. 2: Prepare for spice production

Outcome: Explain the standard practices to be followed by a Spices, herbs and condiments Processing Technician for planning the production

Theory Content:

2.1 Elucidate production planning process.
2.2 Discuss the importance of various process charts, product flow charts of Spices, herbs condiments processing etc.
2.3 Explain the resource management process.
2.4 Explain the procedure to estimate manpower, raw material and capacity.
2.5 List down equipment type and its use.
2.6 Discuss the organizational policies and SOP on cleanliness and maintain production machineries.
2.7 List down the basic concept of food safety and hygiene.
2.8 State waste management procedures.
2.9 List down the methods to inspect tools, equipment and machinery.
2.10 Discuss the procedure to allot work or responsibility to the team.

Practical Content:

2.1 Demonstrate how to analyze the process chart, product flow chart, formulation, chart, etc.
2.2 Exemplify the valuation of manpower and material requirement as per work requirement
2.3 Demonstrate how to estimate the resources as per the requirement (raw materials, packaging materials, machineries, and manpower)
2.4 Illustrate the methods of cleaning and sanitization of tools and equipment used in spice production
2.5 Exhibit the procedure to dispose the different kinds of waste material
2.6 Demonstrate the inspection procedure for the tools, equipment, and machinery
2.7 Prepare samples to plan and prioritize work schedule
2.8 Employ appropriate practices to plan capacity utilization of machineries
2.9 Show how to replace or discard tools, equipment and materials declared unfit to be used for production 2.10 Show how to receive and assemble tools and equipment used in production
2.11Demonstrate the process to assign responsibilities to assistant/helpers

Module No. 3: Production of whole spices, seasonings, spice powder and curry powder

Outcome: Demonstrate the standard work practices followed to produce whole spices, seasonings, spice powder and curry powder

Theory Content:

3.1 Elucidate organisational policies and procedures pertaining to spice production, quality analysis, hazard handling, reporting, documentation, etc.
3.2 List down various types of spices, ingredients and their characteristics that are used in the industry.
3.3 Describe Processing and production of packaged whole spice: grading (destoner and dust cleaner), drying (tray drying, sun drying and fludized bed drying), roasting (optional), sorting, packing and preservation.

3.4 Describe sequence of operations to be followed for producing various types of spices.
3.5 Explain the process of cleaning the spices thoroughly.
3.6 List down the tools and equipment used in spice production, their operation and safe handling.
3.7 State the importance of sterilization in spice processing.
3.8 Discuss the importance of critical control points, its implementation and monitoring for the production process.
3.9 Describe the Technology of spices powder production: cleaning (destoner and dust cleaner), drying (tray drying, sun drying and fludized bed drying), roasting (optional), grinding (hammer mill, pulveriser, single stage grinding, multiple stage grinding, cryo grinding), sieving (2 stage siever and 3 stage siever), blending, packing and preservation.
3.10 List down the different grades of raw materials used in spice production and their usage.
3.11 State the usage of different mesh size as per the product requirement.
3.12 Describe the impact of microbial contamination in spice production and ways to prevent it.
3.13 State the importance of sensory evaluation of different spices.
3.14 Discuss how to identify the variances in the characteristics of spices produced.
3.15 Summarize the information to be recorded and type of records to be maintained for spice manufacturing.

Practical Content:

3.1 Demonstrate the procedure of cleaning unprocessed whole spices thoroughly.
3.2 Show the ways to set controls of different operating equipment.
3.3 Exemplify the steps to prepare the spices for cutting.
3.4 Demonstrate how to sterilize the whole spices. 3.5 Show the procedure of monitoring of the process to ensure food safety and prevent contamination.
3.6 Show how to inspect the produced samples for desired parameters.
3.7 Role play a situation to handover the produced samples to the quality lab for testing as per organisational practice.
3.8 Apply sorting and grading to the whole as per production requirements.
3.9 Demonstrate the procedure to carry out grinding and collecting spice powder, curry powder and seasonings.
3.9 Display how to adjust screens and sieve in the sifting/sieving machine as per processing needs.
3.10 Demonstrate the ways to add ingredients to prepare a mixture for blending as per type of seasoning to be produced.

Module No. 4: Packaging, Wrap, label and post production maintenance of equipment

Outcome: Explain the procedure of wrapping and labeling of products and post production cleaning and maintenance of equipment

Theory Content:

4.1 Explain how to package the spices and materials used in the process.
4.2 State the basic troubleshooting of production machinery utilised in the process.
4.3 Discuss the applicable FSSAI regulations for labelling and importance of following them for spice production.
4.4 Explain the cleaning procedures such as CIP and COP followed in the food processing industry.
4.5 List down how to store the tools, equipment and related materials safely.
4.6 Describe the information to be mentioned on the packaging labels.
4.7 State the types of packaging defects and techniques used for their rectification.
4.8 Summarize the impact of hazards at the workplace and safe practices for disposing them.

Practical Content:

4.1 Display how to load the desired packaging material on the machine appropriately to prepare for packaging.
4.2 Display how to load different spices on the machine for packaging.
4.3 Show how to set controls of the packaging machine and monitor the process.
4.4 Demonstrate the procedure to record information of finished products details as per FSSAI regulations of packaging and labelling, 2011.
4.5 Show how to check for presence of metallic substances in the packaged finished products.
4.6 Show how to report information such as variances in product characteristics to the supervisor accurately.
4.7 Demonstrate the procedure to verify and record production details.
4.8 Employ appropriate practices to transfer the products to quality labs.
4.9 Demonstrate the procedure of cleaning and inspecting work area, tools and equipment after production.

Module No. 5: 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 No. 6: 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

Learning Outcome – Assessment Criteria

Module No.	Outcome	Assessment Criteria
1	Describe the Spices, herbs, condiments, Oleoresins and essential oils in brief	**After completion of this module students will be able to:** 1.1 Classify biomass Spices, condiments, seasonings and culinary herbs; 1.2Identify common parts use as Spices and Herbs, 1.3Identify properties and characteristics of Spices and Herbs, 1.4 Identify Medicinal usage of some therapeutic active spices along with their active components. 1.5 Identify Different types of condiment and herb products along with their application. 1.2 Demonstrate solvent extraction method of oleoresins 1.8 Explain steam distillation method of essential oils
2	Discuss the standard practices to be followed by a Spices, herbs and condiments Processing Technician for planning the production	**After completion of this module students will be able to:** 2.1 Explain the process chart, product flow chart, formulation, chart, etc. 2.3 Estimate the resources as per the requirement (raw materials, packaging materials, machineries, and manpower) 2.4 Explain the methods of cleaning and sanitization of tools and equipment used in spice production 2.5 Dispose the different kinds of waste material 2.6 Perform the inspection procedure for the tools, equipment, and machinery
3	Demonstrate the standard work practices	**After completion of this module students will be able to:** 3.1 Explain the procedure of cleaning unprocessed

Module No.	Outcome	Assessment Criteria
	followed to produce whole spices, seasonings, spice powder and curry powder	whole spices thoroughly. 3.2 prepare the spices for cutting. 3.4 sterilize the whole spices. 3.5 Demonstrate the procedure of monitoring of the process to ensure food safety and prevent contamination. 3.6 Inspect the produced samples for desired parameters. 3.7 Describe samples quality for testing as per organisational practice. 3.8 Demonstrate sorting and grading to the whole as per production requirements. 3.9 Carry out grinding and collecting spice powder, curry powder and seasonings. 3.9 Adjust screens and sieve in the sifting/sieving machine as per processing needs. 3.10 Prepare a mixture for blending as per type of seasoning to be produced.
4	Explain the procedure of wrapping and labelling of products and post production cleaning and maintenance of equipment	**After completion of this module students will be able to:** 4.1 Load the desired packaging material on the machine appropriately to prepare for packaging. 4.2 Load different spices on the machine for packaging. 4.3 Set controls of the packaging machine and monitor the process. 4.4 Record information of finished products details as per FSSAI regulations of packaging and labelling, 2011. 4.5 Check for presence of metallic substances in the packaged finished products. 4.6 Demonstrate the procedure to verify and record production details. 4.9 Explain the procedure of cleaning and inspecting work area, tools and equipment after production.
5	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.)**
6	Employability Skills	As per NCVET guided curriculum

List of Tools, Equipment & materials needed for 30 Trainees

Sl No	Items Name	Specification	Quantity
1	Small Spices Grinder: Complete Fitting and all contacting parts S.S. 304 Space required for install the Machine- 4' X 3' X 7' height	Small Spices Grinder: Complete Fitting and all contacting parts S.S. 304 Space required for install the Machine- 4' X 3' X 7' height H.P. required for running the Machine- 2 H.P. Capacity per Hour (on 60-80 assorted mesh) - for Red Chilly Dry= 3kg/hr. Cumin= 3kg/hr. Coriander seeds= 4kg/hr. Sounf= 4Kg/hr. Black Piper= 5kg/hr. Dry Ginger= 5kg/hr. Fenegreek= 4kg/hr.	01 no
2	Pre Crusher for Turmeric Crushing	Pre Crusher for Turmeric Crushing: Complete fitting with S.S.304 lining & 2 H.P. Motor.	01 no
3	Small Horizontal Powder Mixer:	Small Horizontal Powder Mixer: Space Required- 3'X3'X5' height H.P. Required- 2-3 H.P. Capacity – 10-15 kg per charge	01 no
4	Small Vibrator Screen:	Small Vibrator Screen: Space Required- 3'X3'X5' height H.P. Required- 1 H.P. Capacity – 75 kg/hr.	01 no
5	Mini Impact Pulveriser for Grinding Turmeric	Mini Impact Pulveriser for Grinding Turmeric: Space required for install the Machine- 3' X 6' X 7' height H.P. required for running the Machine- 2/3 H.P. Capacity per Hour- 7kg/hr. on 60-80 assorted mesh. Complete Fitting and all contacting parts S.S. 304	01 no
6	Hot air oven (24''×24''×24'') inch size	Hot air oven (24''×24''×24'') with blower digital temp(Multispan) and time	01 no

Sl No	Items Name	Specification	Quantity
		control, inside made of 304SS of 20gage, out side of MS with powder coated finish, ball catcher heavy door. Three side heating elements, Standard double wall febrication, 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 of high or low rates of power thermostat control knob and indicators for mains & thermostat,	
7	Digital pH Meter, Range : 0 to 14pH	Digital 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), 4 digit LED display with automatic polarity and decimal indications, With one combination electrode, stand , clamp, buffers, dust cover & manual. Supply with pH 4.01 buffer, pH 7.00 buffer pH 10.01 buffer	01 no
8	High precision balance Capacity=1000 g	High precision balance Capacity=1000gm Readability=0.001 SS Pan size (mm) = 128×128	01 no
9	High precision balance Capacity=6100 g	High precision balance Capacity=6100gm Readability=0.01 SS Pan size (mm) = 165×165	01 no
10	Digital electronics balance ,capacity 0.1 mg-120 g	Digital electronics balance ,capacity 0.1mg-120gm, accuracy 0.0001gm, pan dia 80mm	01 no
11	Digital electronics balance, capacity : 5mg-210 g	Digital electronics balance, capacity : 5mg-210gm, accuracy 0.001gm, SS pan	01 no
12	*Chemical Balance*	*Self calibration Capacity: 0.01mg-220gm Pan size: 80 mm Linearity : ± 0.2 mg Repeatability standard deviation: >/=0.1 mg Response time : 12/3 sec Sensitivity against temperature change Specific gravity measurement software % display function Unit conversion Calibration*	01 no

Sl No	Items Name	Specification	Quantity
		report ISO/GLP Compliance for printing the value (weights, calibration with date & time)	
13	Physical rough balance Capacity=30 Kg	Physical rough balance Capacity=30Kg Readability=0.5gm SS Pan size (mm) = 250×330	02 nos
14	Magnetic Starrer, with Hot Plate	Magnetic Starrer, with Hot Plate, with Stepless Speed control &S.S. body and top. Stirring capacity 5lt liquid. It utilises magnetic filed created by a Heavy duty permanent magnet which induces variable speed stirring action. Stirring is accomplished by means of small teflon rotor, which when placed to be stirred is capable or rotation by magnetic field applied from below the container. Fitted with pilot lamp.	01 no
15	Refrigerator having five star BEE mark	Refrigerator having five star BEE mark with separate deep freeze and normal freeze,Capacity - 500lit and above. Supply with voltage stabilizer 3KV	01 no
16	moisture content by toluene displacement method	toluene displacement Apparatus	01 no
17	Muffle furnce, size of inner chamber (5''x 5''x 10'')inch	Muffle furnce, size of inner chamber (5''x 5''x 10'')inch, for 1000˚C working, outer casing made of heavy duty M.S. materials and sheet duly painted finished, heating elements are better quality. For 1000˚C working 3.0KW.	01 no
18	Soxhlet apparatus with six chamber mantle type,flask capacity 250ml	Soxhlet apparatus with six chamber mantle type,flask capacity 250ml, 2 vertical,2 horizontal rods with adaptor and screw to hold flask ,six test heater of high quality nicrom wire with cotton cover including soxhlet apparatus glass parts, RB flask of 250ml , extractor, condenser, silicon tube.	01 no
19	Serological water bath	Serological water bath, Double wall insulation, total 304SS of 20gauge(inner and outer), capacity (12x250ml) (16''×12''×10'') 304SS lid, Ambient to 110 °C and digital temperature indicator. one outlet with ball valve	01 no
20	Centrifuge 15ml capacity	centrifuge, maximum rotating speed limit 5250 rpm with angle rotor head 15ml × 16 capacity	01 no

Marks Distribution

Outcome	Outcome Code	Total Th Marks	Total Pr Marks
Describe the Spices, herbs, condiments, Oleoresins and essential oils in brief	FPT/1106/OC1	50	180
Explain the standard practices to be followed by a Spices, herbs and condiments Processing Technician for planning the production	FPT/1106/OC2	40	160
Demonstrate the standard work practices followed to produce whole spices, seasonings, spice powder and curry powder	FPT/1106/OC3	30	150
Explain the procedure of wrapping and labelling of products and post production cleaning and maintenance of equipment	FPT/1106/OC4	30	160
Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	FPT/1106/OC5	0	150
Employability Skill-60 Hrs	DGT/VSQ/N0102	50	0