

**MAHARASHTRA STATE BOARD OF VOCATIONAL EDUCATION EXAMINATION, MUMBAI**

1	Name of Syllabus	C. C. In Food Processing (401209)																																																								
2	Max.Nos of Student	25 Students																																																								
3	Duration	1 Year																																																								
4	Type	Full Time																																																								
5	Nos Of Days/Week	6 Days																																																								
6	Nos Of Hours/Days	7 Hrs																																																								
7	Space Required	Workshop = 1500 Sq feet Class Room = 200 Sq feet TOTAL = 1700 Sq feet																																																								
8	Entry Qualification	S.S.C.																																																								
9	Objective Of Syllabus/ introduction	Awareness of Safety precautions Knowledge of Engineering skill, use of tools in Food Processing. Awareness of Food Preservation. Awareness of Bakery & Confectionary. Awareness of Milk & Dairy Product. Awareness of Agro Processing Awareness of Food Beverages. Awareness of Processed Food.																																																								
10	Employment Opportunity	The trainee will either to be able to take up jobs with agencies which Maintain Develop Food processing or with working experience will be in a position to start his own independent Business.																																																								
11	Teacher's Qualification	Diploma in Food Processing/ Hotel Management. With 3 year Teaching experience in Food Processing.																																																								
12	Training System	Training System Per Week <table><tr><td>Theory</td><td>Practical</td><td>Total</td></tr><tr><td>18 Hours</td><td>24 Hours</td><td>42 Hours</td></tr></table>							Theory	Practical	Total	18 Hours	24 Hours	42 Hours																																												
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13	Exam. System	<table><tr><td>Sr.</td><td>Paper Code</td><td>Name of Subject</td><td>TH/PR</td><td>Hours</td><td>Max. Marks</td><td>Min. Marks</td></tr><tr><td>1</td><td>40120911</td><td>Food Preservation &amp; Food Beverages.</td><td>TH-I</td><td>3 hrs</td><td>100</td><td>35</td></tr><tr><td>2</td><td>40120912</td><td>Bakery, Confectionary, Milk &amp; Dairy Product.</td><td>TH-II</td><td>3 hrs</td><td>100</td><td>35</td></tr><tr><td>3</td><td>40120913</td><td>Agro Processing &amp; Processed Food.</td><td>TH-III</td><td>3 hrs</td><td>100</td><td>35</td></tr><tr><td>4</td><td>40120921</td><td>Food Preservation &amp; Food Beverages.</td><td>PR-I</td><td>3 hrs</td><td>100</td><td>50</td></tr><tr><td>5</td><td>40120922</td><td>Bakery, Confectionary, Milk &amp; Dairy Product.</td><td>PR-II</td><td>3 hrs</td><td>100</td><td>50</td></tr><tr><td>6</td><td>40120923</td><td>Agro Processing &amp; Processed Food.</td><td>PR-III</td><td>3 hrs</td><td>100</td><td>50</td></tr><tr><td></td><td></td><td>TOTAL</td><td></td><td></td><td>600</td><td>255</td></tr></table>	Sr.	Paper Code	Name of Subject	TH/PR	Hours	Max. Marks	Min. Marks	1	40120911	Food Preservation & Food Beverages.	TH-I	3 hrs	100	35	2	40120912	Bakery, Confectionary, Milk & Dairy Product.	TH-II	3 hrs	100	35	3	40120913	Agro Processing & Processed Food.	TH-III	3 hrs	100	35	4	40120921	Food Preservation & Food Beverages.	PR-I	3 hrs	100	50	5	40120922	Bakery, Confectionary, Milk & Dairy Product.	PR-II	3 hrs	100	50	6	40120923	Agro Processing & Processed Food.	PR-III	3 hrs	100	50			TOTAL			600	255
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**Syllabus**  
**Food Preservation & Food Beverages**

<b>Theory – I</b> <b>Food Preservation &amp; Food Beverages</b>	<b>Practical – I</b> <b>Food Preservation &amp; Food Beverages</b>
Importance of Food Preservation Technology Common terms used in Food Processing	Identification of different food products available in market
Food groups on the basis of pH value, technology, physiology changed conditions	Categories the food items based on properties
Principle of preservation Different food Preservation techniques	
Principle of food drying/dehydration General Process of fruit drying General Process of vegetable drying General methods of food drying dehydration, sun drying, mechanical drying etc. Types of dryers Quality characteristics of dried fruits and vegetables Treatments prior to drying	Using dryers dry fruits & vegetables Carry out treatment prior to drying
Principle of pickle production Theory of different types pickle production Fermented, oil, vinegar pickles	Production of different types pickle e.g. fermented, oil, vinegar pickles from fruits and vegetables, mixed pickles
Different types of tomato products Preparation of tomato Products . Principle and preparation methods of tomato ketchup, sauce, puree, paste, chutneys	Preparation of tomato ketchup, sauce, puree, paste, chutneys
Canning process flow diagramme for fruits & vegetables Pretratments . Canning machinery Knowledge of chemicals required Canning of fruits & vegetables	Operation of canning machinery Canning operations Caning of seasonal fruits & vegetables
Principle of jam and jelly preparation Flow diagram for preparation of jam and jellies. Test of pectin for jam and jelly preparation	Preparation of seasonal fruits Preparation of different fruit jams like, mango, apple, pineapple, banana, amla, guava, papaya, mixed fruit etc Preparation of jelly from fruits like, apple, guava, jackfruit etc. Preparation of jam and jelly marmalades Testing of pectin in fruits Testing of end point in jam and jelly
Principle and methods for production of glazed fruits, candy, fruit bar and toffees	Preparation of glazed fruits, candy, fruit bar and toffees.
Principle of vinegar production. Different types of vinegars. Factors involving good quality vinegar.	Preparation of synthetic vinegar Preparation of fermented vinegar Preparation of different fruit vinegar, flavoured vinegars
Wastes from fruits and vegetables. Processing techniques for proper utilization of wastes from fruits and vegetables.	Preparation of products from wastes e.g. Vinegar from pineapple waste, pectin from citrus fruits wastes, vinegar and protein isolate mango kernel, starches

Quality factors in fruit and vegetable processing & preservation	Tests for quality evaluation
Analytical methods for evaluation of chemical and nutritional composition of fruits and vegetables Need and importance of storage and packaging Methods Storage techniques for fruits, vegetables and grains Cold storage, refrigeration Packaging materials used Selection of appropriate packing methods	Analysis of fruits and vegetables for their quality.
Importance of food beverages for entrepreneurship Scope of food beverages	
<input type="checkbox"/> Types of beverages <input type="checkbox"/> Need of particular beverage <input type="checkbox"/> Classification of food beverages <input type="checkbox"/> Raw materials used for beverages <input type="checkbox"/> PFA- standards for food beverages <input type="checkbox"/> Synthetic soft drinks <input type="checkbox"/> Process of manufacture of soft drinks <input type="checkbox"/> Quality of water for soft drinks <input type="checkbox"/> Food additives used in soft drinks <input type="checkbox"/> Quality control in a soft drink manufacturing industry	<input type="checkbox"/> Selection of ingredients for soft drink production <input type="checkbox"/> Preparation of different soft drinks <input type="checkbox"/> Packaging of the soft drinks (Bottling, polu pouches, peps type, can) <input type="checkbox"/> Quality testing in soft drinks
<input type="checkbox"/> Introduction to different fruits juices <input type="checkbox"/> Principle and methods. <input type="checkbox"/> Machinery involved in different fruits juice extraction <input type="checkbox"/> Ready-To-Serve (RTS) fruit beverages, <input type="checkbox"/> Squash, fruit juice, nectar concentrate, syrup, sherbets <input type="checkbox"/> Process of manufacture <input type="checkbox"/> Quality control in Beverage industry. <input type="checkbox"/> FPO standards for fruit Beverages <input type="checkbox"/> Beverage from other materials, grains <input type="checkbox"/> Malt, vegetable (tomato), herbs & medicinal plants	<input type="checkbox"/> Production of juices from fruits <input type="checkbox"/> Production of Ready-To-Serve (RTS) fruit beverages, <input type="checkbox"/> Production of squash, fruit juice, nectar, concentrate <input type="checkbox"/> Quality testing of beverage <input type="checkbox"/> Fruits used : mango, orange, papaya, lemon, jamun  <input type="checkbox"/> Preparation of malt syrup, badam , psta, hearbal, concentrates, rose syrup
<input type="checkbox"/> Principle and method for production of mineral water <input type="checkbox"/> Quality standard (BIS) of water. <input type="checkbox"/> Different types of water, RO, UV, Ozonated .	<input type="checkbox"/> General purification techniques <input type="checkbox"/> Production of mineral water from mini water treatment plant <input type="checkbox"/> Quality of packaged water
<input type="checkbox"/> Principle and Method of soda water production <input type="checkbox"/> Quality standards for soda water	<input type="checkbox"/> Production of soda water <input type="checkbox"/> Packaging, labeling and storage of soda water
<input type="checkbox"/> Principle and methods. <input type="checkbox"/> Raw material <input type="checkbox"/> Fermentation <input type="checkbox"/> Storage	<input type="checkbox"/> Preparation of malt extract <input type="checkbox"/> Preparation of cider, vinegar, banana, pineapple beverages
<input type="checkbox"/> Equipment used e.g. Juice extractor, pulper, fermenter, vinegar generator, crown corking machine, bottle filling machine, Soda water machine, basket press, filter press <input type="checkbox"/> Maintenance of machines <input type="checkbox"/> Safety	<input type="checkbox"/> Handling of equipment safely <input type="checkbox"/> Fault identification and removal of faults

Trainees Kit Sl. No.	Item/ Specification	Quantity proposed for a batch of 25 trainees
1.	Litmus paper	As required
2.	Food colour kit	10
3.	Bottle sealing unit (to be shared)	08
4.	Juice extracting unit (to be shared)	08
5.	Mixie (to be shared)	02
6.	Soda making machine (to be shared)	02
7.	Crown cooking machine (to be shared)	02
8.	Food quality testing kit (to be shared)	02
9.	Food beverage packets	10
10.	Moisture meter Hand operated (to be shared)	04
11.	Moisture box (to be shared)	04
12.	Measuring glass (to be shared)	04
14.	Hand gloves	10
15.	Apron	10
16.	Cap	10
17.	Boots	10
18.	Hand bag	10

Sl. No.	Item/ Specification	Quantity proposed for a batch of 25 trainees
1.	Oven : 5 KW,	01
2.	Platform scale balance : 100 Kg Capacity,	01
3.	<b>Meat cutting knives</b> : Heavy duty SS	As required
4.	Seed germinator : Cabinet type, Different chambers, Temp and RH Controller	01
5.	Vinegar generator : Chamber made of SS, with sparger and baffles	01
6.	Fermenter : Bioreactor, SS, with sparger and baffles	01
7.	Vegetable slicing machine	01
8.	Automatic pouch machine / filler sealer machine	01
9.	Plumping Machine for fruits and vegetables	01
10.	Kettle	01
11.	Fruit mill	01
12.	Gel meter	01
13.	Can body reformer	01
14.	Can seamer	01
15.	Exhaust box	01
16.	Auto clave	01
17.	Cup sealer	01
18.	Steel scale : 12 “ standard steel	02
19.	Steel tape : Scales 1 meter, and of 50 ft	02
20.	Weight box : For balances	01

21.	Cutting equipments : Different knives, Cutters for fruits /Vegetables	As required
22.	Sinks : standard size	01
23.	Hot plate : Electrical 2 KW	01
24.	Pickle mixer : Rotatory type, Contact Parts of SS	01
25.	Heat sealing machine :Hand / pedal	01

### Bakery, Confectionary, Milk & Dairy Product

	Theory – II	Practicals - II
<b>Bakery and confectionery in food industry</b>	<input type="checkbox"/> Importance of bakery and confectionery in food industry <input type="checkbox"/> Industrially important cereals	
<b>Bakery Products</b>		
• Flour	<input type="checkbox"/> Different industrially important bakery products. <input type="checkbox"/> Flours for the bakery products <input type="checkbox"/> Quality of flour for the production of bakery items.	<input type="checkbox"/> Production of quality flour for bread, biscuit and cakes <input type="checkbox"/> Production of plain, fermented, malt, rye flour <input type="checkbox"/> Flour, fat, bakers yeast, sugar and salt, I.S.I. standards for flour, fat, Baker's yeast.
• Bread	<input type="checkbox"/> Principle involved for bread production <input type="checkbox"/> Different types of breads and their uses <input type="checkbox"/> Ingredients used in bread production	<input type="checkbox"/> Use of different food machinery for bread production <input type="checkbox"/> Production of plain bread, fermented bread, protein rich bread and special breads
• Biscuit and cookies	<input type="checkbox"/> Basic method of biscuit production. <input type="checkbox"/> Ingredients for biscuit production. <input type="checkbox"/> Machinery involved in biscuit production <input type="checkbox"/> Factors affecting the quality of product	<input type="checkbox"/> Production of different types of popular biscuits. <input type="checkbox"/> Production of different types of specialized biscuits. <input type="checkbox"/> Production of different types of other products like cookies, crackers
<b>Cake</b>	<input type="checkbox"/> Methods for the production of cakes <input type="checkbox"/> Ingredients for cake production <input type="checkbox"/> Machinery involved in cake production <input type="checkbox"/> Factors affecting the quality	<input type="checkbox"/> Production of different types of popular cakes <input type="checkbox"/> Production of different types of specialized cakes

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**Starch**

- ☐ Availability of starch in different cereals
- ☐ Extraction of starch
- ☐ Different products of grain starch

- ☐ Preparation of corn starch, starch biscuits, Namkins, snacks

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**Quality standards**

- ☐ Quality standards and evaluation of product

- ☐ Testing of raw material and product for their quality.

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**Primary processing equipment**

- ☐ Equipment used e.g. flour mill, mixer, molding machines, oven balance, packing machines
- ☐ Location of faults
- ☐ Safety

- ☐ Handling of equipment safely
- ☐ Fault identification and removal of faults

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**Storage and packaging**

- ☐ Need and importance of storage and packaging for bakery items
- ☐ Methods of storage & packaging

- ☐ Pack the given food products and seal
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Sl. No.	Item/ Specification	Quantity proposed for a batch of 25 trainees
1.	Hand operated moisture meter (to be shared)	04
2.	Moulds of biscuit & breads (to be shared)	08
3.	Spring balance (to be shared)	04
4.	Bread cutting knife	10 sets
5.	Knife of different size (set)	10 sets
6.	Spoons	10 sets
7.	Measuring glass (to be shared)	08
8.	Fruit knife	10 sets
9.	Dies (to be shared)	04
10.	Hand gloves	10
11.	Apron	10
12.	Cap	10
13.	Boots	10
14.	Hand bag	10

No.	Item/ Specification	Quantity proposed for a batch of 25 trainees
1.	Flour mill/ mini grain mill : Standard size	01
2.	Planetary mixer : 3 gear,	01
3.	Moulding machines	01
4.	Sheeting machine	01
5.	Bread cutting machine	01
6.	Oven : Standard size with temperature control	01
7.	Packing machine	01
8.	Electronic balance	01
9.	Physical balance	01
10.	Working table SS	01
11.	Toffee dies	01
12.	Biscuit moulds of different sizes :	As required
13.	Cake dies	As required
14.	Electric oven	01
15.	Moisture box	01
16.	Flash evaporator	01
17.	Can body reformer	01
18.	Can seamer	01
19.	Exhaust box	01
20.	Auto Clave	01
21.	Cup sealer	01
22.	Vacuum pan	01
23.	Vernier Caliper : 15 cm. 0.01 mm LC	02
24.	Screw Gauge : Micrometer, 0.001 mm LC, 10 cm cap	02
25.	Steel scale : 12 “ standard steel	04
26.	Steel tape : Scales 1 meter, and of 50 ft	04
27.	Weight box : For balances up to 2 Kg	02
28.	Cutting equipments : Different knives, Cutters for fruits /Veg	As required
29.	Sinks : standard size	01
30.	Hot plate : Electrical 2 KW	01
31.	Pickle Mixer : Rotatory type, Contact Parts of SS	01
32.	Heat sealing machine : Hand / pedal operated	01
33.	Tanks SS : 50 liters capacity, cylindrical with cap	01
34.	Syrup tanks : 50-100 lit capacity SS	01
35.	Pressure Cooker : 5 Kg and 10 Kg SS	01 each
36.	Liquid filling machine : For filling liquid in bottles, 200 ml, 500 ml, 1000 ml. Manual	01 each
37.	SS Filter : Sieve type cloth filter, hydraulic,	01
38.	Sugar coating pan : SS, Revolving type with speed control,	01
39.	Bottle opener : Heavy duty, Stainless Steel	01
40.	Burette : 50 ml digital Automatic/ ordinary glass	06
41.	Pipette : 5-50 ml capacities, glass	04
42.	Working tables : Stainless Steel Size 6’ X 3’	01
43.	Improved stoves : Made of MS with proper safety Measures, Valves etc	02

44.	Stainless steel / Aluminum pots : Different Capacities	01 set
45.	Wooden spoons : Different sizes	01 set
46.	Solar dryer (cabinet type) : Complete with solar box, Size approx 6' X 3'	01

Theory		Practicals
<b>Dairy industry</b>	<ul style="list-style-type: none"> <li>☑ Importance of dairy industry</li> <li>☐ Introduction to operation flood (white revolution)</li> </ul>	
<b>Milk</b>	<ul style="list-style-type: none"> <li>☑ Property of milk</li> <li>☐ Quality of raw milk</li> <li>☐ Products made from the milk</li> <li>☐ Introduction to different dairy products useful for marketing.</li> </ul>	<ul style="list-style-type: none"> <li>☑ Testing of milk for its quality</li> <li>☐ Primary processing of market milk.</li> <li>☐ Storage of milk</li> </ul>
• Processing of Milk	<ul style="list-style-type: none"> <li>☑ Principle of milk processing</li> <li>☐ Method of production of pasteurized milk</li> <li>☐ Standard, toned, double toned flavoured milks.</li> <li>☐ Ingredients of special milks, fermented milk</li> </ul>	<ul style="list-style-type: none"> <li>☐ Production of pasteurized milk</li> <li>☐ Production of standard, toned, double toned flavoured milks, fermented milk.</li> <li>☐ Storage of products</li> </ul>
• Dairy Products	<ul style="list-style-type: none"> <li>☐ Preparation methods of Cheese, Chhana, Mawa,</li> <li>☐ Preparation methods of Dahi, Srikhand, Cream, buttermilk</li> </ul>	<ul style="list-style-type: none"> <li>☐ Preparation of Cheese, Chhana, Mawa,/</li> <li>☐ Preparation of Dahi, Srikhand, Ghee, Cream, buttermilk etc.</li> </ul>
• Ghee	<ul style="list-style-type: none"> <li>☐ Different methods of Ghee production</li> <li>☐ Quality of ghee</li> </ul>	<ul style="list-style-type: none"> <li>☐ Production of Ghee by different methods</li> </ul>
• Butter	<ul style="list-style-type: none"> <li>☐ Method of butter production</li> <li>☐ Quality of butter</li> </ul>	<ul style="list-style-type: none"> <li>☐ Preparation of butter.</li> <li>☐ Test of quality of butter</li> </ul>
☐ Dairy sweets	<ul style="list-style-type: none"> <li>☐ Preparation methods of different dairy based sweets</li> <li>☐ Storage of sweets.</li> </ul>	<ul style="list-style-type: none"> <li>☐ Preparation of different dairy based sweets.</li> </ul>
☐ Ice-cream	<ul style="list-style-type: none"> <li>☐ Principle of ice-cream production</li> <li>☐ Method of ice-cream production</li> <li>☐ Quality of ice cream</li> <li>☐ Different types of ice creams</li> </ul>	<ul style="list-style-type: none"> <li>☐ Preparation of ice cream.</li> <li>☐ Quality evaluation of ice cream</li> <li>☐ Storage of ice-cream</li> </ul>

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☐ Other Dairy products

☐ Different dairy products like dried milk, condensed milk

☐ Preparation of different dairy products like dried milk, condensed milk, cheese

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**Processing equipment**

☐ Equipment used e.g. Cream Separator, deep fridge, cheese vat, pasteurizer, kettle, butter churner, boiler,( optionally mini dairy plant)  
☐ Maintenance of equipment  
☐ Safety

☐ Handling of equipment safely  
☐ Fault identification and removal of faults  
☐ Safe operation

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**Storage and packaging**

☐ Need and importance of storage and packaging  
☐ Methods

☐ Pack the given food products and seal

**Trainees Kit**

Sl. No.	Item/ Specification	Quantity proposed for a batch of 25 trainees
1.	Lactometer (to be shared)	04
2.	Dairy product catalogue of different product	02 sets
3.	Packaging machine hand operated (to be shared)	04
4.	Milk testing kit (to be shared)	04
5.	Hand operated weighting unit (to be shared)	04
6.	Hand operated sealing machine (to be shared)	04
7.	Fat measuring kit (to be shared)	04
8.	Electric Kettle (to be shared)	04
9.	Moisture box (to be shared)	04
10.	Measuring glass (to be shared)	08
11.	Hand gloves	10
12.	Apron	10
13.	Cap	10
14.	Boots	10
15.	Hand bag	10

**Equipment, Machine & Tools**

Sl. No.	Item/ Specification	Quantity proposed for a batch of 25 trainees
1.	Mini dairy plant : Complete Mini-processing unit for milk.	01
2.	Milk Chiller : For chilling milk up to a temperature of about –10 °C	01
3.	Milk cans : Made of steel/ Aluminium, 40 –100 lit capacity	As required
4.	Cream separator : Motor operated, Centrifugal, capacity up to 1-2 Kg/ cream per min.	01

5.	Cheese vat : Made of heavy Stainless steel (306), size approx. 4'X 2.5'X 1' with proper outlet and taps	01
6.	Plate pasteurizer	01
7.	Butter churner	01
8.	Boiler	01
9.	Deep fridge	01
10.	Steam jacketed kettle with surface scrapper	01
11.	Mawa machine	01
12.	Crown capping machine	01
13.	Form fill seal machine	01
14.	Ice cream plant	01
15.	Cenfrifuge : For Fat estimation in milk,	01
16.	Gerber tubes for fat estimation	01
17.	Electric oven	01
18.	Moisture box	01
19.	Automatic pouch machine / filler sealer machine	01
20.	Kettle	01
21.	Flash evaporator .	01
22.	Can body reformer	01
23.	Can seamer	01
24.	Exhaust box.	01
25.	Cup sealer	01
26.	Vacuum pan	01
27.	Vernier caliper : 15 cm. 0.01 mm LC	02
28.	Screw Gauge : Micrometer, 0.001 mm LC, 10 cm cap	04
29.	Steel scale : 12 “ standard steel	02
30.	Steel tape : Scales 1 meter, and of 50 ft	02
31.	Weight box : For balances	01
32.	Cutting equipments : Different knives, Cutters for fruits /Veg	As required
33.	Sinks : standard size	01
34.	Hot plate : Electrical 2 KW	01
35.	Pickle mixer : Rotatory type, Contact Parts of SS	01
36.	Heat sealing machine : Hand / pedal operated	01
37.	Tanks SS : 50 liters capacity, cylindrical with cap	01
38.	Syrup tanks : 50, 100 lit capacity SS	01
39.	Pressure cooker : 5 Kg and 10 Kg SS	01
40.	Liquid filling machine : For filling liquid in bottles, 200 ml, 500 ml, 1000 ml. Manual	As required
41.	SS filter : Sieve type cloth filter, hydraulic,	01
42.	Sugar Coating pan : SS, Revolving type with speed control,	01
43.	Bottle opener : Heavy duty, Stainless Steel	01
44.	Burette : 50 ml digital Automatic/ ordinary glass	01
45.	Pipette : 5-50 ml capacities, glass	As required
46.	Lab glasswares : Different sizes and types	As required
47.	Working tables : Stainless Steel Size 6' X 3'	01
48.	Improved stoves : Made of MS with proper safety Measures, Valves etc	01
49.	Stainless steel / Aluminum pots : Different Capacities	As required
50.	Wooden spoons : Different sizes	As required

## Agro Processing & Processed Food

	Theory - III	Practicals - III
<b>Agro processing industry</b>	<ul style="list-style-type: none"> <li>☐ Introduction of agro processing industry</li> <li>☐ Scope of agro processed products for entrepreneurship</li> </ul>	<ul style="list-style-type: none"> <li>☐ Conducting survey of the different agro products from the market</li> </ul>
<b>Machinery in Agro processing</b>	<ul style="list-style-type: none"> <li>☐ Different machines used in agro processing industry</li> <li>☐ Working principles, cost and capacity of machines in agro processing industry</li> </ul>	<ul style="list-style-type: none"> <li>☐ Working with agro processing machinery</li> <li>☐ Capacity evaluation of different agro processing machines</li> </ul>
<b>Cereal grains, wheat</b>	<ul style="list-style-type: none"> <li>☐ Different grains suitable for agro processing</li> <li>☐ Primary processing of wheat</li> <li>☐ Cleaning, grading, milling</li> <li>☐ Standards for the wheat flour</li> <li>☐ Production of different wheat product</li> </ul>	<ul style="list-style-type: none"> <li>☐ Cleaning, grading and other pre-processing activities</li> <li>☐ Production of whole wheat flour</li> <li>☐ Production of Suji, Maida, Dalia</li> <li>☐ Packaging and labeling the product</li> </ul>
<b>Dal (Pulse) Milling</b>	<ul style="list-style-type: none"> <li>☐ Principle of dal milling</li> <li>☐ Pulses suitable for milling</li> <li>☐ Different Methods of dal milling</li> <li>☐ Dal mills</li> <li>☐ Pre-treatment in dal milling</li> <li>☐ Waste utilization</li> </ul>	<ul style="list-style-type: none"> <li>☐ Pre-treatment in dal milling like cleaning, grading, soaking, drying</li> <li>☐ Milling pulses for production of dal, e.g. pigeon pea, green gram, Bengal gram</li> <li>☐ Packaging and uses of wastes from dal mill</li> </ul>
<b>Packaged whole grains</b>	<ul style="list-style-type: none"> <li>☐ Suitability of whole grains for marketing</li> <li>☐ Production of packed whole grains</li> <li>☐ Packaging, labeling, storage and marketing of</li> </ul>	<ul style="list-style-type: none"> <li>☐ Production of packed whole grains like Bengal gram, black gram, green gram, groundnut</li> </ul>
<b>Spice Grinding</b>	<ul style="list-style-type: none"> <li>☐ Spices suitable for grinding</li> <li>☐ Principle and method of spice grinding</li> <li>☐ Machinery used for spice</li> </ul>	<ul style="list-style-type: none"> <li>☐ Procurement and Pre-processing of spices, cleaning, grading, destoning</li> <li>☐ Working with machinery</li> </ul>

	grinding ☐ Ensuring good quality product	for spice grinding ☐ Production of spice powders from, coriander, black peeper, red chilly, turmeric ☐ Packaging of whole spice grains for marketing
<b>Oil Milling</b>		
	☐ Methods of oil milling ☐ Different types of oil expellers ☐ Oilseeds, properties and suitability ☐ Process flow chart for oil milling ☐ Filtration and packaging	☐ Working of oil expellers ☐ Oil expelling from different oil seeds e.g. mustard, groundnut, rapeseed, sunflower ☐ Filtration and packaging of oil
<b>Rice Milling</b>		
	☐ Properties of paddy for rice milling ☐ Process of rice milling ☐ Hullers	☐ Processing of paddy for rice
<b>Groundnut decorticators</b>		
	☐ Different groundnut decorticators ☐ Decortication, cleaning, grading and packaging	☐ Working with groundnut decorticators for production of decorticated groundnut
<b>Storage and packaging</b>		
	☐ Need and importance of storage and packaging ☐ Methods	☐ Pack the given food products and seal
<b>Quality</b>		
	☐ Quality standards for packed processed products	☐ Development of good quality package and testing of the quality with market survey and demand
<b>Processing equipments</b>		
	☐ Equipment used e.g. Flour mill, Mini grain mill, pulverizer, hammer mill, FIDMill	☐ Handling and practice on the equipment ☐ Fault identification and
	Flour separator, Dal Mill, Packing machine (Heat sealing machine), Balance ☐ Maintenance of equipment ☐ Safety	removal of faults

	Theory	Practicals
<b>Meat</b>	<ul style="list-style-type: none"> <li>□ Importance of meat processing for entrepreneurship</li> <li>□ Scope of meat processing industry</li> </ul>	
• Meat Processing	<ul style="list-style-type: none"> <li>□ Methods of meat processing.</li> <li>□ Post mortem changes during meat processing.</li> <li>□ Quality of meat</li> <li>□ Canning, pickling, preservation of meat.</li> </ul>	<ul style="list-style-type: none"> <li>□ Meat processing : cutting (carcassing), cleaning, storage, sanitation</li> <li>□ Handling and practice on meat processing equipment safely</li> <li>□ Practical on canning, pickling, preservation of meat</li> </ul>
<b>Fish Processing</b>	<ul style="list-style-type: none"> <li>□ Principle and methods of fish processing</li> <li>□ Quality of fish suitable for processing</li> <li>□ Dehydration, canning, pickling of fish, Fishmeal protein, fishmeal powder</li> </ul>	<ul style="list-style-type: none"> <li>□ Experiment on fish quality for processing</li> <li>□ Production of Dehydrated canned, pickled fish, Fish meal protein, fish meal powder</li> </ul>
<b>Poultry</b>		
• Egg	<ul style="list-style-type: none"> <li>□ Importance of egg production</li> <li>□ Storage and preservation methods of egg</li> <li>□ Production methods of egg albumin, powder and other useful products from egg</li> <li>□ Quality of egg and products</li> <li>□ Pickling, canning of egg</li> </ul>	<ul style="list-style-type: none"> <li>□ Production methods of egg albumin, powder and other useful products from egg</li> <li>□ Preparation of egg pickle</li> <li>□ Preparation of canned egg and canned egg pickle</li> </ul>
• Poultry processing	<ul style="list-style-type: none"> <li>□ Methods of chicken processing</li> </ul>	<ul style="list-style-type: none"> <li>□ Chicken processing</li> <li>□ Quality testing of chicken meat</li> <li>□ Preparation of processed product from chicken e.g.</li> </ul>
<b>Soya Products</b>	<ul style="list-style-type: none"> <li>□ Details of soya product</li> <li>□ Processing methods of soya milk, soya paneer (tofu), soya-atta, soya-</li> </ul>	<ul style="list-style-type: none"> <li>□ Preparation of soya milk, soya paneer (tofu), soya-atta, soya-snacks, soya-srikhand, namkins</li> </ul>

	snacks, soya-srikhand, namkins	
<b>Papad</b>	<ul style="list-style-type: none"> <li>□ Raw material for papad production</li> <li>□ Method of preparation of different types of papad</li> <li>□ Packaging and quality of papad</li> </ul>	<ul style="list-style-type: none"> <li>□ Preparation of ingredients for papad production</li> <li>□ Preparation of different types of papad</li> </ul>
<b>Sprouted Grains</b>	<ul style="list-style-type: none"> <li>□ Importance of sprouted/germinated foods</li> <li>□ Material selection for sprouting</li> <li>□ Methods for preparation of germinated grains</li> <li>□ Requirements for sprouting grains</li> <li>□ Individual and mixed sprouted grains</li> </ul>	<ul style="list-style-type: none"> <li>□ Selection of raw material for Preparation of sprouting</li> <li>□ Preparation of individual sprouted grains, pulsed, groundnut, wheat, alfa etc.</li> <li>□ Preparation of mixed sprouted grains</li> <li>□ Package development and marketing of sprouted grains</li> </ul>
<b>Medicinal and herbal Products</b>	<ul style="list-style-type: none"> <li>□ Importance of medicinal and herbal products</li> <li>□ Processing methods of medicinal and herbal products</li> </ul>	<ul style="list-style-type: none"> <li>□ Processing of herbal products</li> </ul>
<b>Natural colour and flavour and food additives</b>	<ul style="list-style-type: none"> <li>□ Different species for colour and flavour production</li> <li>□ Colours and flavours used in food industry</li> <li>□ Methods of production of natural colour and flavours</li> </ul>	<ul style="list-style-type: none"> <li>□ Preparation and extraction of natural colour and flavours</li> <li>□ Preparation of food additives</li> </ul>
<b>Food additives</b>	<ul style="list-style-type: none"> <li>□ Use of different food additives for preservation</li> </ul>	<ul style="list-style-type: none"> <li>□ Food preservation using natural and chemical additives</li> <li>□ Value addition with chemicals and additives</li> </ul>
<b>Primary processing machinery</b>	<ul style="list-style-type: none"> <li>□ Equipment used e.g. Meat mincer, cutting machine, canning unit, packaging machine</li> <li>□ Soya plant, papad press, etc.</li> </ul>	<ul style="list-style-type: none"> <li>□ Handling and practice on the equipment</li> <li>□ Fault identification and removal of faults</li> <li>□ Safe operation</li> </ul>

- ☐ Seed germinator, refrigerator, etc.
- ☐ Location of faults
- ☐ Safety

## Marketing

- ☐ Market survey procedures
- ☐ Strategies for marketing
- ☐ Methods of marketing feedback
- ☐ Cost analysis & attractive packaging
- ☐ Advertising
- ☐ Contact customers
- ☐ Estimate requirements
- ☐ Collect feedback
- ☐ Workout cost of product & competition

## Equipment, Machine & Tools

No.	Item/ Specification	Quantity proposed for a batch of 25 trainees
1.	Hammer mill : Power operated, one HP 50 Kg/hr	01
2.	Groundnut decorticator hand operated : Hand operated 20 Kg/hr	01
3.	Mini dal mill : Power operated, 2 HP 100 Kg/hr	01
4.	Mini rice mill : Power operated, 2 HP 100 Kg/hr	01
5.	Mini oil expeller : Power operated, 10 HP 25 lit/hr	01
6.	Grain cleaner : Power operated, 01 HP; 300 Kg/hr	01
7.	Mini grain mill : Power operated, 01 HP 20 Kg/hr	01
8.	Wheat flour mill : Power operated 5 HP 100 Kg/hr	01
9.	Micro pulverizer : Power operated, 2 HP 50 Kg/hr	01
10.	Storage bins of different capacity : Aluminium, 100-1000 Kg Capacity with proper outlet and inlet	As required
11.	Platform scale balance : 100 Kg Capacity,	01
12.	Electric oven : For moisture determination, 0-250 °C, digital display, 2'X2'X2'	01
13.	Moisture box : Aluminium, 100 g capacity cylindrical	01
14.	Destoner : For cleaning light materials, air classifier type	01
15.	Packaging material : PP, PE, laminated, Stand pouches	As required
16.	Soya milk plant with kettle and paneer press :	01
17.	Papad press and dough mixer : Hand operated , 50 papad/h	01
18.	Meat Cutting knives,; Heavy duty SS	As required
19.	Seed germinator : Cabinet type, Different chambers , Temp anf RH Controller	01
20.	Vinegar generator : Chamber made of SS, with sparger and baffles	01
21.	Fermenter : Bioreactor , SS, with sparger and baffles	01
22.	Vegetable slicing machine	01
23.	Auto clave	01
24.	Working tables : Stainless Steel Size 6' X 3'	01
25.	Stainless steel knives: : 12-15 cm blade	As required
26.	Spoons : Stainless steel, various shapes and sizes	As required
27.	Household sieves : Stainless steel	As required

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