

MAHARASHTRA STATE BOARD OF VOCATIONAL EDUCATION EXAMINATION, MUMBAI

1	Name of Syllabus	C.C. in Food and Vegetables Processing (401115)																																									
2	Max. Nos of Student	25 Students																																									
3	Duration	6 Months																																									
4	Type	Full Time																																									
5	Nos Of Days / Week	6 Days																																									
6	Nos Of Hours /Days	7 Hrs																																									
7	Space Required	Workshop = 1000 Sq feet <u>Class Room = 200 Sq feet</u> TOTAL = 1200 Sq feet																																									
8	Entry Qualification	S.S.C.+ MSBVE's Any one Catering Course pass																																									
9	Objective Of Syllabus/ introduction	1. Awareness of Safety precautions 2. Knowledge of Engineering skill, use of tools in Food Processing. 3. Awareness of Food Preservation. 4. Awareness of Food and Vegetables Processing. 5. Awareness of Food Beverages. 6. Awareness of Processed Food.																																									
10	Employment Opportunity	The trainee will either to be able to take up jobs with agencies which Maintain Develop Food and Vegetables Processing or with working experience will be in a position to start his own independent Business.																																									
11	Teacher's Qualification	Diploma/Certificate in concern subject																																									
12	Training System	Training System Per Week <table><tr><td>Theory</td><td>Practical</td><td>Total</td></tr><tr><td>12 Hours</td><td>30 Hours</td><td>42 Hours</td></tr></table>							Theory	Practical	Total	12 Hours	30 Hours	42 Hours																													
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13	Exam. System	<table><tr><th>Sr. No.</th><th>Paper Code</th><th>Name of Subject</th><th>TH/PR</th><th>Hours</th><th>Max. Marks</th><th>Min. Marks</th></tr><tr><td>1</td><td>40111511</td><td>Food and Vegetables Processing</td><td>TH I</td><td>3 hrs</td><td>100</td><td>35</td></tr><tr><td>2</td><td>40111521</td><td>Food Preservation</td><td>PR I</td><td>3 hrs</td><td>100</td><td>50</td></tr><tr><td>3</td><td>40111522</td><td>Food and Vegetables Processing.</td><td>PR II</td><td>6 hrs</td><td>200</td><td>100</td></tr><tr><td></td><td></td><td>TOTAL</td><td></td><td></td><td>400</td><td>185</td></tr></table>	Sr. No.	Paper Code	Name of Subject	TH/PR	Hours	Max. Marks	Min. Marks	1	40111511	Food and Vegetables Processing	TH I	3 hrs	100	35	2	40111521	Food Preservation	PR I	3 hrs	100	50	3	40111522	Food and Vegetables Processing.	PR II	6 hrs	200	100			TOTAL			400	185						
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Food and Vegetables Processing


Theory - I	Practicals - II
<ul style="list-style-type: none"> □ Introduction, importance of Fruits and vegetables Preservation Technology □ Nature of the fruits and vegetables in respect of their preservation □ Different terms used in processing □ Groups of fruits and vegetables on the basis of pH, physiology changed (perishable nature) technology. □ Principle & techniques involved for different Fruit & Vegetable preservation. 	<ul style="list-style-type: none"> □ Collect seasonal fruits and vegetable products. □ Categories different fruits and vegetable products, according to criteria. □ Operate different food machinery □ Perform Canning operations. <ul style="list-style-type: none"> • Caning of <ul style="list-style-type: none"> o Mango slice, o Guava, o Pineapple, o Strawberry, o Grapes, o Potato, o Cucumber, o Mushroom, o Spinach, o Cauliflower, o Cabbage etc
<p>Canning fruits and vegetables, process flow diagram for canning, canning machinery, pretreatments before canning operations, basic requirements (brine/syrup/chemicals)</p> <p>□ Fruits and vegetable drying/dehydration: General methods of fruits & vegetable drying /dehydration, sun drying, mechanical drying, types of dryers, characteristics of dried fruits and vegetables, treatments prior to drying, general process of fruit and vegetable drying. Specialized drying operations in fruits and vegetables.</p> <p>□ Jam and jelly : Principle of making jam and jellies, suitability of the fruits for the preparation of jam & jellies, process flow diagram for jam and jellies. Test of pectin for jam and jelly preparation</p> <p>□ Glazed fruits, candy, fruit bar and toffees : Principle and methods of production</p> <p>□ Pickles : Principle of pickle production, different types of pickles from fruits and vegetables, fermented pickles, oil pickles, vinegar pickles.</p>	<p>□ Drying carryout operations on fruits and vegetables using different dryers.</p> <ul style="list-style-type: none"> • Drying of <ul style="list-style-type: none"> o Mango slice, o Apple rings, o Grapes, o Pear, o Pineapple, o Fig, o Banana, o Pomegranate, o Bael fruit, o Papaya and o Other fruits, o Tomato slices, o Okra, o Brinjal, o Potato, o Ginger, o Bitter guard o Other vegetables <p>Test pectin in fruit juices & pulps.</p> <p>□ Visit process plants and write a report.</p>

<p>Tomato product: Preparation methods of tomato ketchup, chutney, sauce, puree, paste.</p> <p>☐ Potato chip manufacturing, finger chips process and machinery.</p> <p>☐ Vinegar : Different types of vinegars, principle of vinegar production, characteristics of good quality vinegar.</p> <p>☐ Wastes from fruits and vegetables, processing techniques for proper utilization of wastes from fruits and vegetables.</p> <p>☐ Quality factors in fruit and vegetable processing & preservation</p> <p>☐ Storage techniques for fruits and vegetables, cold storage, refrigeration.</p>	<p>☑ Practice on preparation of different fruit jams like,</p> <ul style="list-style-type: none"> • Mango, • Apple, • Pineapple, • Banana, • Papaya • Amla, • Mixed fruit • Other fruits <p>☑ Practice on preparation of different fruit jelly from fruits like,</p> <ul style="list-style-type: none"> • Apple, • Guava, • Jackfruit • Amla • Other fruits <p>☑ Prepare jam and jelly marmalades</p> <p>☑ Test end point in jam and jelly.</p> <p>☑ Prepare glazed fruits, candy, fruit bar and toffees.</p>
<p>☑ Analytical methods for evaluation of chemical and nutritional composition of fruits and vegetables, equipment used.</p> <p>☑ Location of faults</p> <p>☑ Safety in fruits and vegetable industry Indian Food Standard</p> <p>☐ Food safety standard Act 2005 & Bill2005</p> <p>☑ Prevention of Food adulteration Act 1954(37-1954)</p> <p>☑ Fruit produced order 1955</p> <p>☑ Any order issued under essential commodity Act 1955</p> <p>International Food Standard(SPS,TBT,Drug,Residues Chemicals,GMO)</p> <p>Codex Alimentarius (FAO Food & Nutrition Paper) FAO2003</p>	<p>☐ Prepare different types of pickle from fruits and vegetables:</p> <ul style="list-style-type: none"> • Fermented pickle, • Oil pickle, • Vinegar pickles, • Mixed pickles <p>☑ Prepare tomato ketchup, sauce, puree & paste.</p> <p>☐ Prepare potato chips & finger chips.</p> <p>☐ Prepare synthetic, fermented and flavoured vinegars</p> <p>☐ Prepare products from wastes e.g. Vinegar from pineapple waste, pectin from citrus fruits wastes, vinegar and protein isolate mango kernel, starches.</p> <p>☐ Analyse fruits and vegetables for their quality.</p> <p>☑ Identify fault and take corrective measures.</p>

List of equipment, tools and instruments

Sl. No.	Item/ Specification	Quantity
1.	Working tables	02
2.	Improved stoves	03
3.	Stainless steel pots of different capacities	04 sets
4.	Stainless steel knives, 12-15 cm blade	08
5.	Stainless steel spoons, various shapes and sizes	08 sets
6.	Glass jars, various sizes and screw-on caps	50
7.	Bottle brushes	10
8.	Solar drier	01
9.	Wooden spoons	08
10.	Juice extractor	02
11.	Pulper	01
12.	Vinegar generator	02
13.	Fermenter,	01
14.	Crown corking machine	01
15.	Bottle filling machine	01
16.	Cabinet dryer	01
17.	Soda water machine	01
18.	Basket press	01
19.	Filter press	01
20.	Pouch packing machine	01
21.	Farm fill seal machine	01
22.	Vegetable cutter	01
23.	Food Processor with vegetable cutting attachment	01

Food Preservation

Practical - I
Identification of different food products available in market
Categorise the food items based on properties
Using dryers dry fruits & vegetables Carry out treatment prior to drying
Production of different types pickle e.g. fermented, oil, vinegar pickles from fruits and vegetables, mixed pickles
Preparation of tomato ketchup, sauce, puree, paste, chutneys
<input type="checkbox"/> Operation of canning machinery <input type="checkbox"/> Canning operations <input type="checkbox"/> Caning of seasonal fruits & vegetables
<input type="checkbox"/> Preparation of seasonal fruits <input type="checkbox"/> Preparation of different fruit jams like, mango, apple, pineapple, banana, amla, guava, papaya, mixed fruit etc <input type="checkbox"/> Preparation of jelly from fruits like, apple, guava, jackfruit etc. <input type="checkbox"/> Preparation of jam and jelly marmalades <input type="checkbox"/> Testing of pectin in fruits <input type="checkbox"/> Testing of end point in jam and jelly
<input type="checkbox"/> Preparation of glazed fruits, candy, fruit bar and toffees.
<input type="checkbox"/> Preparation of synthetic vinegar <input type="checkbox"/> Preparation of fermented vinegar <input type="checkbox"/> Preparation of different fruit vinegar, flavoured vinegars
<input type="checkbox"/> Preparation of products from wastes e.g. Vinegar from pineapple waste, pectin from citrus fruits wastes, vinegar and protein isolate mango kernel, starches
Tests for quality evaluation
<input type="checkbox"/> Analysis of fruits and vegetables for their quality.
 Pack the given food products and seal

Equipment, Machine & Tools

Sl. No.	Item/ Specification	Quantity
1.	Cabinet dryer (Electrical)	01
2.	SS trays	As required
3.	Lemon squeezer	06
4.	Bottle washer	02
5.	Crown corking machine (Hand operated/ pedal operated)	01
6.	Baby Fruit pulper	02
7.	Mixer-grinder/Food processors	04
8.	Water purifier	02
9.	Sulfuring chamber	01
10.	Blancher cum sterilizer	01
11.	Oven : 5 KW,	01
12.	Hand / table model refractometer : Abbes type, 0-32; 28-70. 58-90 of 0-100 (Bench type)	02
13.	Storage Bins of different capacity :	As required
14.	Electronic balance	01
15.	Electric oven : For moisture determination, 0-250 °C, digital display, 2'X2'X2'	02
16.	Moisture box : Aluminum, 100 g capacity cylindrical	02
17.	Vinegar generator :	01
18.	Fermenter :	01
19.	Vegetable slicing machine	01
20.	Automatic pouch machine/ filler sealer machine : including a batch coding, perforation and notching unit	01
21.	Pulping machine for fruits and vegetables	01
22.	Fruit mill Junior Model, 0.5 Ton/h with 1 hp motor.	01
