

**Class XII**

**Food Processing Technician (FPTN)**

**Semester III**

**Detail of Theory Syllabus**

<b>SL no</b>	<b>Content</b>	<b>Details</b>	<b>Marks</b>	<b>Periods</b>
1.	Introduction to Training Program and Overview of Food Processing and preservation	<ul style="list-style-type: none"><li>• Define food processing</li><li>• List the various sub sectors of food processing industry</li><li>• Explain different types of fruits and vegetables processing</li><li>• State the need for processing and preservation of fruits and vegetables</li><li>• classification of food according to nutrient content, sources and specially about moisture content</li><li>• State the methods of testing fruits and vegetables for accepted quality Standards.<ul style="list-style-type: none"><li>• Different types of spoilages in fresh fruits and vegetables.</li></ul></li></ul>	6	09
2.	Nutritional aspect of Fruits and vegetables	<ul style="list-style-type: none"><li>• Essential nutrients present in foods- Carbohydrate, Protein, Fats, Vitamins, Minerals ( types, sources, properties, functions, estimation technique)</li><li>• Nutritional value of different fruits and vegetables</li><li>• Basic science for loss of nutritive value of fruits and vegetables during processing</li></ul>	6	09
3	General principles and methods of Fruits and vegetables preservation	<ul style="list-style-type: none"><li>• Storage of fresh fruits and vegetable. Methods and containers used in fresh fruits and vegetable preservation</li><li>• Commercial methods food preservation (Pasteurization, Sterilization, Canning and Bottling, Drying and Dehydration, Refrigeration and Freezing, Irradiation, Smoking)</li><li>• Home Scale methods food preservation (Sun drying, Pickling, Cooking, Boiling, Steaming, blanching, Roasting, Fermentation, Preservation of Jam/ Jellies/ Juices/ Squashes/ Marmalades)</li><li>• Canning of fruits and vegetables- basic principles, procedure and steps</li><li>• Sun drying &amp; dehydration and its merits and demerits. Principle involved preservation by drying method. Treatment prior to drying.</li><li>• Study of Frozen Fruits and Vegetables, Refrigeration and Freezing.</li><li>• Definition of Preservatives- types of</li></ul>	8	12

		preservatives commonly used in food industry limits of usage of preservatives		
4.	Selection of raw materials including fruits and vegetables	<ul style="list-style-type: none"> <li>Select raw materials including fruits and vegetables for Preparation of various products. Spices and other constituents, their properties, condiments and other additives and ingredients, colouring and flavouring agent.</li> </ul>	6	09
5	Prepare and package fruit beverages such as Squashes, RTS, Nectar, Cordial, Crush and Syrup	Technology of extraction of juices from different types of fruits. Manufacturing of Fruit beverages: Squashes, syrups, nectars, RTS, crushes, cordial etc.	4	06
<b>TOTAL</b>			<b>30</b>	<b>45</b>

## Class XII

### Semester IV

SL no	Content	Details	Marks	Periods
1.	Preparation of Jam, Jelly and marmalade	<ul style="list-style-type: none"> <li>Selection and grading of raw fruits and vegetables</li> <li>washing of fruits and vegetables before they go for processing</li> <li>Technology of extraction of juices from different types of fruits and vegetable. <ul style="list-style-type: none"> <li>technique/ process of preparation of jam/ jelly/marmalade (<b>ripe mango, green mango, pineapple, apple, guava, orange</b>)</li> <li>the technique/ process of preparation of mixed fruits jam/ jelly (<b>Mango, guava, strawberry, orange etc.</b>)</li> <li>technique/ process of preparation of sauce/ ketchup (<b>tomato, chili</b>)</li> </ul> </li> <li>Product packaging and analysis the quality of the finished product</li> <li>cleaning of machineries used with recommended sanitizers following CIP (clean-in-place) procedure</li> <li>cleaning of equipment and tools used with recommended cleaning agents and sanitizers</li> </ul>	4	9
2.	Preparation of tomato juice/ tomato puree/ tomato paste/ tomato sauce/ tomato ketchup/ tomato chutney/ tomato soup	<ul style="list-style-type: none"> <li>Manufacturing process of tomato juice/ tomato puree/ tomato paste/ tomato sauce/ tomato ketchup/ tomato chutney/ tomato soup. <ul style="list-style-type: none"> <li>Preservation of tomato juice/ tomato puree/ tomato paste/ tomato</li> </ul> </li> </ul>	6	12

		<p>sauce/tomato ketchup/tomato chutney/tomato soup.</p> <ul style="list-style-type: none"> <li>• Analysis of TSS and acidity of tomato products</li> </ul>		
3.	Pickle Making	<p>Selection and grading of raw fruits and vegetables</p> <ul style="list-style-type: none"> <li>• washing of fruits and vegetables before they go for processing</li> <li>• peeling and slicing of fruits and vegetables</li> <li>• preparation of brine solution</li> <li>• curing of fruits and vegetable. <ul style="list-style-type: none"> <li>• technique/ process of preparation of salty and oily pickle (<b>green mango, green chili, lemon, ginger, mixed type, )</b></li> <li>• technique/ process of preparation of sweet pickle (<b>Mango, plum, papaya, date, mango lather, mixed type etc.)</b></li> <li>• Product packaging and analysis of quality of the finished product</li> </ul> </li> <li>• cleaning the machineries used with recommended sanitizers following CIP (clean-in-place) procedure</li> <li>• cleaning the equipment and tools used with recommended cleaningagents and sanitizers</li> </ul>	8	18
4.	Study of various types of containers like Glass, Tin materials, plastic pouch.	<p>Study of various types of containers like Glass, Tin merits and demerits of each-scope for new types of containers/ packaging materials, such as plastic pouches, plastic bottle and cartons.</p> <ul style="list-style-type: none"> <li>• Understanding the label its importance, and labelling requirements</li> </ul>	6	12
5.	Food Safety, Hygiene and Sanitation for Packaging Food	<ul style="list-style-type: none"> <li>• importance of safety, hygiene and sanitation in the Jam, Jelly, Ketchup and pickle making industry</li> <li>• industry standards to maintain a safe and hygiene workplace</li> <li>• HACCP principles to eliminate food safety hazards in the process andproducts HACCP, ISO 22000, GMP, and FSSAI. <ul style="list-style-type: none"> <li>• Importance of personal Hygiene, Cleaning &amp; Sanitary standards in Fruits and Vegetable preservation. Good Handling Processes (GHP),</li> <li>• Traceability aspects of processed product.</li> </ul> </li> <li>• safety practices in the work area</li> </ul>	6	12
	<b>TOTAL</b>		<b>30</b>	<b>63</b>

## Detail of Practical Syllabus

SL no	Content	Details	Marks	Periods
1	Spoilage of fruits and	Identifications of different types of Spoilage occur in fruits and vegetables	05	10
2	Canning of fruits and vegetables	Canning of peas, tomato, carrot, pineapple, mango, potato	03	08
3	Drying of fruits and vegetables	Drying of potato, carrots, peas, cabbage in tray dryer and solar dryer	05	12
4	Study and handling of common food processing equipment.	Study of common food processing equipment such as pulper, sealers, juice extracting machines, autoclaves, steam jacketed kettle, pickle mixer etc.	05	12
5	Preparation of tomato products	Preparation of tomato juices, puree, sauces, ketchup	07	30
6	Preparation of Jam, jelly and marmalades	preparation of jam/ jelly/marmalade ( <b>ripe mango, green mango, pineapple, apple, guava, orange</b> ) ● preparation of mixed fruits jam/ jelly ( <b>Mango, guava, strawberry, orange etc.</b> )	07	24
7	Preparations of different types of pickles from fruits and vegetables	preparation of salty and oily pickle ( <b>green mango, green chili, lemon, ginger, mixed type, )</b> ●preparation of sweet pickle ( <b>Mango, plum, papaya, date, mangolather, mixed type etc.</b> )	07	24
8	Examination of processed products. Cleaning and maintenance of the equipments.	Examination of processed products. Cleaning and maintenance of the equipments. Detection of benzoic acid, sulphur dioxide and KMS in fruits and vegetable products.	03	08
9	Analysis of the raw material and finished product	Pectin grade, Acidity of fruit juice and pickle, Total Solid content, Brix measurement, Moisture content, Ash content, reducing and non reducing sugar content. Study on the shelf life of the finished product.	05	10
10	Packaging and Labeling	Study of containers like Glass, Tin, packaging materials, such as plastic pouches, plastic bottle and cartons. information to be mentioned on label and pack.	03	06
	<b>TOTAL</b>		<b>50</b>	<b>144</b>