

# **JAM, JELLY, KETCHUP AND PICKLE MAKING TECHNICIAN (IJKPA)**

## **Syllabus**

(Safety Practices 25 Hrs, Theory 100 Hrs, Practical 450 Hrs, Employability Skill 75 Hrs)

### **Detail of Theory Syllabus**

<b>SL NO</b>	<b>CONTENT</b>	<b>DETAILS</b>
1	Introduction to Training Program and Overview of Food Processing Industry	<ul style="list-style-type: none"><li>• Introduction of various sub sectors of food processing industry</li><li>• Difference in between fruits and vegetable,</li><li>• Different types of fruits and vegetable and their chemical composition, physical &amp; chemical treatment for increasing post harvest shelf life,</li><li>• Different microbial groups associated with fruits &amp; vegetables, microbial change during storage, Effects of enzymes on quality of fruit &amp; vegetable storage, methods for preventing microbial attack on fruit &amp; vegetable during harvesting &amp; storage.</li></ul>
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>
3	General principles and methods of Fruits and vegetables preservation.	<ul style="list-style-type: none"><li>• Storage &amp; handling – CA, MA storage, Storage of fresh fruits and vegetable. Methods and containers used in fresh fruits and vegetable preservation, ,</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, Cold storage</li><li>• Definition of Preservatives-types of preservatives commonly used in food industry limits of usage of preservatives</li></ul>
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>
5	Preparation of Work Area and Process Machineries for Jam, Jelly and Ketchup	<ul style="list-style-type: none"><li>• Description of materials and equipment used in the cleaning and maintenance of the work area</li><li>• Type of detergents and sanitizers used in cleaning work area and machineries</li><li>• The methods of cleaning and sanitization</li><li>• The process of preparing the work area for scheduled production</li><li>• Description of the functions of all equipment before starting production</li></ul>
6	Production of Jam, Jelly, marmalade and Ketchup	<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.</li><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><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</li></ul>

		agents and sanitizers •
7	Prepare and Maintain Work Area and Process Machineries for pickle making	<ul style="list-style-type: none"> <li>• Description of materials and equipment used in the cleaning and maintenance of the work area</li> <li>• Type of detergents and sanitizers used in cleaning work area and machineries</li> <li>• The methods of cleaning and sanitization</li> <li>• The process of preparing the work area for scheduled production</li> <li>• Description of the functions of all equipment before starting production</li> </ul>
8	Pickle Making	<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>• Peeling and slicing of fruits and vegetables</li> <li>• Preparation of brine solution</li> <li>• Curing of fruits and vegetable.</li> <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> <li>• Cleaning the machineries used with recommended sanitizers following CIP (clean-in-place) procedure</li> <li>• Cleaning the equipment and tools used with recommended cleaning agents and sanitizers</li> </ul>
9	Study of various types of containers like Glass, Tin materials, plastic pouch.	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. Understanding the label its importance, and labelling requirements
10	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 and products</li> <li>• HACCP, ISO 22000, GMP, and FSSAI.</li> <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> <li>• safety practices in the work area</li> </ul>

### Detail of Practical Syllabus

SL NO	CONTENT	DETAILS
1	Spoilage of fruits and vegetables	Identifications of different types of Spoilage occur in fruits and vegetables
2	Selection and grading of raw Fruits and vegetables.	Method of grading of different types of raw Fruits and vegetables.
3	Selection of spices and food additives.	Spices and other constituents, condiments and other additives and ingredients, and flavouring, colouring agent and preservative.
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.
5	Preparation of tomato products	Preparation of tomato juices, puree, sauces, ketchup and chili sauce
6	Preparation of Jam, jelly and	<ul style="list-style-type: none"> <li>• Preparation of jam/ jelly/marmalade (<b>ripe mango, green mango, pineapple, apple, guava, orange</b>)</li> </ul>

	marmalades	<ul style="list-style-type: none"> <li>Preparation of mixed fruits jam/ jelly (<b>Mango, guava, strawberry, orange etc.</b>)</li> </ul>
7	Preparations of different types of pickles from fruits and vegetables	<ul style="list-style-type: none"> <li>Preparation of salty and oily pickle (<b>green mango, green chili, lemon, ginger, mixed type, )</b></li> <li>Preparation of sweet pickle (<b>Mango, plum, papaya, date, mango lather, mixed type etc.</b>)</li> </ul>
8	Examination of processed products. Cleaning and maintenance of the equipment.	Examination of processed products. Cleaning and maintenance of the equipments. Detection of benzoic acid, sulphur dioxide and KMS in fruits and vegetable products.
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.
10	Packaging and Labelling	Study of containers like Glass, Tin, packaging materials, such as plastic pouches, plastic bottle and cartons. Information to be mentioned on label and pack.

### Detail of Employability Skills Syllabus

Sl. No.	Content	Details
1.	English Literacy & Communication Skills	<p>Accentuation (mode of pronunciation) on simple words, Diction (use of word and speech)</p> <p>Transformation of sentences, Voice change, Change of tense, Spellings. Reading and understanding simple sentences about self, work and environment. Construction of simple sentences, Writing simple English.</p> <p>Speaking with preparation on self, on family, on friends, classmates, on know, picture reading gain confidence through role-playing . Taking messages, passing messages on and filling in message forms Greeting and introductions office hospitality, Resumes or curriculum vita essential parts, letters of application reference to previous communication.</p> <p>Communication and its importance, Principles of Effective communication, Types of communication – verbal, non verbal, written, email, talking on phone. Non verbal communication –characteristics, components-Para-language,</p> <p>Body – language,</p> <p>Barriers to communication and dealing with barriers.</p> <p>Handling nervousness/ discomfort.</p> <p>Self awareness, Importance of Commitment, Ethics and Values, Ways to Motivate Oneself, Personal Goal setting and Employability Planning.</p> <p>Manners, Etiquettes, Dress code for an interview, Do's &amp; Don'ts for an interview, Problem Solving, Confidence Building, Attitude.</p>
2.	I.T. Literacy	Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer.

		<p>Basics of Operating System, WINDOWS, The user interface of Windows OS, Create, Copy, Move and delete Files and Folders, Use of External memory like pen drive, CD, DVD etc, Use of Common applications.</p> <p>Basic operating of Word Processing, Creating, opening and closing Documents, use of shortcuts, Creating and Editing of Text, Formatting the Text, Insertion &amp; creation of Tables. Printing document.</p> <p>Basics of Excel worksheet, understanding basic commands, creating simple worksheets, understanding sample worksheets, use of simple formulas and functions, Printing of simple excel sheets</p> <p>Internet, Concept of Internet (Network of Networks),</p> <p>Meaning of World Wide Web (WWW), Web Browser, Web Site, Web page and Search Engines. Accessing the Internet using Web Browser, Downloading and Printing Web Pages, Opening an email account and use of email. Social media sites and its implication.</p> <p>Information Security and antivirus tools, Do's and Don'ts in Information Security, Awareness of IT – ACT, types of cyber crimes.</p>
3.	Entrepreneurship Skills	<p>Entrepreneurship vs. management, Entrepreneurial motivation. Performance &amp; Record, Role &amp; Function of Entrepreneur, Qualities of a good Entrepreneur, SWOT and Risk Analysis. Concept &amp; application of PLC, Sales &amp; distribution Management. Different Between Small Scale &amp; Large Scale Business, Market Survey, Method of marketing, Publicity and advertisement, Marketing Mix.</p> <p>Preparation of Project. Role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies / Programmes &amp; procedure &amp; the available scheme.</p> <p>Project formation, Feasibility, Legal formalities i.e., Shop Act, Estimation &amp; Costing, Investment procedure – Loan procurement – Banking Processes.</p>
4.	Productivity & Quality Tools	<p>Definition, Necessity, Meaning of GDP.</p> <p>Personal / Workman – Incentive, Production linked Bonus, Improvement in living standard. Industry Nation.</p> <p>Skills, Working Aids, Automation, Environment, Motivation. How improves or slows down.</p> <p>Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance.</p> <p>Meaning of quality, Quality characteristic. Definition, Advantage of small group activity, objectives of quality Circle, Roles and function of Quality Circles in Organization, Operation of Quality circle. Approaches to starting Quality Circles, Steps for continuation Quality Circles.</p>

		<p>Idea of ISO 9000 and BIS systems and its importance in maintaining qualities.</p> <p>Purpose of Housekeeping, Practice of good Housekeeping. Basic quality tools with a few examples</p>
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## **Outcomes**

<b>Outcomes to be assessed/NOS to be assessed</b>	<b>Assessment criteria for the outcome</b>
1. Explain overview of Food Processing Industry	1.1 Define food processing 1.2 List the various sub sectors of food processing industry 1.3 Explain different types of fruits and vegetables processing 1.4 State the need for processing of fruits and vegetables 1.5 List the various units within a fruits and vegetables processing unit 1.6 State the methods of testing fruits and vegetables for accepted quality standards 1.7 Observe the spoiled fruits and vegetables and its products. 1.8 Identify and record the cause of spoilage.
2 Explain the Concept of Nutritional value of different Fruits and vegetables	2.1 Explain essential nutrients present in foods- Carbohydrate, Protein, Fats, Vitamins, Minerals 2.2 Explain concept of nutritional value of different fruits and vegetables 2.3 Identify loss of nutritive value of fruits and vegetables during processing
3 Illustrate the process of preservation of Fruits and vegetables.	3.1 Identify fresh fruits and vegetable storage and containers used in fresh fruits and vegetable preservation 3.2 Explain Canning of fruits and vegetables-basic principles, procedure and steps 3.3 Explain Sun drying & dehydration and its merits and demerits. 3.4 Demonstrate Principle involved preservation by drying method. 3.5 Explain Frozen Fruits and Vegetables, Refrigeration and Freezing. 3.6 Name the preservatives commonly used in food industry
4 Select raw materials like fruits and vegetables, spices, colouring and flavouring agents.	4.1 Select raw materials including fruits and vegetables for Preparation of various products. 4.2 Select Spices, condiments, colouring and flavouring agent and other constituents, 4.3 Explain properties of food additives and ingredients
5 Prepare and maintain work area and process machineries for Jam, Jelly and Ketchup	5.1 Identify materials and equipment used in the cleaning and maintenance of the work area 5.2 Identify common detergents and sanitizers used in cleaning work area and machineries 5.3 Demonstrate methods of cleaning and sanitization 5.4 Prepare the work area for scheduled production 5.5 Demonstrate the functions to be carried out before starting production 5.6 Explain the different types of maintenance procedures 5.7 Conduct minor repairs and faults in process machineries

<p>6 Plan and Demonstrate Production of Jam, Jelly, marmalade and Ketchup</p>	<p>6.1 Perform production planning for effective utilization of raw material and machineries</p> <p>6.2 Identify the raw material, machineries and packaging material requirement</p> <p>6.3 Plan the batch size</p> <p>6.4 Check the performance of all equipments</p> <p>6.5 Check the raw material quality (<b>Pectin content, Acidity of fruit juice and pickle, Total Solid content, Brix measurement, Moisture content, Ash content, reducing and non-reducing sugar content</b>)</p> <p>6.6 Demonstrate the weighing of raw materials</p> <p>6.7 Perform a check if all the machineries are clean and in good working conditions</p> <ul style="list-style-type: none"> <li>• Demonstrate assembling of all components of machines</li> <li>• Perform a pre check on all machineries</li> </ul> <p>6.8 Check the quality of fruits and vegetables</p> <ul style="list-style-type: none"> <li>• Perform the washing of fruits and vegetables before they go for processing</li> </ul> <p>6.9 Perform pulping and juice extraction from fruits and vegetables</p> <p>6.10 Demonstrate the technique/ process of preparation of jam/ jelly/marmalade (<b>ripe mango, green mango, pineapple, apple, guava, orange</b>)</p> <p>6.11 Demonstrate the technique/ process of preparation of mixed fruits jam/ jelly (<b>Mango, guava, strawberry, orange etc.</b>)</p> <p>6.12 Demonstrate the technique/ process of preparation of sauce/ ketchup (<b>tomato, chili</b>)</p> <p>6.13 Check the finish product quality (<b>Acidity of fruit juice and pickle, Total Solid content, Brix measurement, Moisture content, Ash content, reducing and non-reducing sugar content</b>)</p> <p>6.14 Detection of benzoic acid, sulphur dioxide and KMS in finish products.</p> <p>6.15 Demonstrate the packaging and analyze the quality of the finished product</p> <p>6.16 Demonstrate cleaning the machineries used with recommended sanitizers following CIP (clean-in-place) procedure</p> <ul style="list-style-type: none"> <li>• Demonstrate cleaning the equipment and tools used using recommended cleaning agents and sanitizers</li> </ul>
<p>7 Prepare and Maintain Work Area and Process Machineries for pickle making</p>	<p>7.1 State the materials and equipment used in the cleaning and maintenance of the work area</p> <p>7.2 State the common detergents and sanitizers used in cleaning work area and machineries</p> <ul style="list-style-type: none"> <li>• State the methods of cleaning and sanitization</li> </ul> <p>7.2 Perform the process of preparing the work area for scheduled production</p> <p>7.3 Describe the functions to be carried out before starting production</p> <p>7.4 State the different types of maintenance procedures</p> <ul style="list-style-type: none"> <li>• Conduct minor repairs and faults in process machineries</li> <li>• Prepare the machines and tools required for production</li> </ul>

<p>8 Plan and Demonstrate Pickle Making</p>	<p>8.1 Plan the production order</p> <ul style="list-style-type: none"> <li>• Calculate the various raw materials that may be required</li> <li>• Calculate the packing material and the finished product</li> <li>• Calculate the process time required for the production</li> <li>• Check the raw material quality (<b>Acidity of fruit juice and pickle, Total Solid content, Brix measurement, Moisture content, Ash content, reducing and non reducing sugar content</b>)</li> </ul> <p>8.2 Perform a check if all the machineries are clean and in good working conditions</p> <ul style="list-style-type: none"> <li>• Demonstrate assembling of all components of machines</li> <li>• Perform a pre check on all machineries</li> </ul> <p>8.3 Demonstrate receiving of the fruits and vegetables</p> <ul style="list-style-type: none"> <li>• Demonstrate sorting and grading</li> <li>• Demonstrate the peeling and slicing of fruits and vegetables</li> <li>• Demonstrate the preparation of brine solution</li> <li>• Demonstrate the curing of fruits and vegetable.</li> </ul> <p>8.4 Demonstrate the technique/ process of preparation of salty and oily pickle (<b>green mango, green chili, lemon, ginger, mixed type, )</b></p> <p>8.5 Demonstrate the technique/ process of preparation of sweet pickle (<b>Mango, plum, papaya, date, mango lather, mixed type etc.)</b></p> <p>8.6 Check the finish product quality (<b>Acidity of fruit juice and pickle, Total Solid content, Brix measurement, Moisture content, Ash content, reducing and non reducing sugar content</b>)</p> <p>8.7 Detection of benzoic acid, sulphur dioxide and KMS in finished products.</p> <p>Demonstrate the packaging and analyze the quality of the finished product</p> <ul style="list-style-type: none"> <li>• Demonstrate cleaning the machineries used with recommended sanitizers following CIP (clean-in-place) procedure</li> <li>• Demonstrate cleaning the equipment and tools used using recommended cleaning agents and sanitizers</li> </ul>
<p>9 Identify various types of packaging materials like Glass, Tin materials, plastic pouch with labeling requirement</p>	<p>9.1 Choose 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> <p>9.2 Explain the label and its importance, and labeling requirements</p>

<p>10. Demonstrate knowledge of Food Safety, Hygiene and Sanitation for Packaging Food</p>	<p>10.1 State the importance of safety, hygiene and sanitation in the Jam, Jelly, Ketchup and pickle making industry</p> <p>10.1.1 Apply the industry standards to maintain a safe and hygiene workplace</p> <p>10.1.2 Apply HACCP principles to eliminate food safety hazards in the process and products HACCP, ISO 22000, GMP, and FSSAI.</p> <p>10.1.3 Explain the importance of personal Hygiene, Cleaning &amp; Sanitary standards in Fruits and Vegetable preservation. Good Handling Processes (GHP),</p> <p>10.2 Traceability aspects of processed products.</p> <p>10.3 Apply safety practices in the work area</p>
<p>11. Understand and practice soft skills</p>	<p>11.1 Assessor will rate the trainee on his ability to practice soft skills, including clear and concise communication, in day to day work with team and with higher authority</p>
<p>12. Demonstrate knowledge of concepts and principles of basic arithmetic and financial calculation, and apply knowledge of specific areas to perform practical operations.</p>	<p>12.1 Apply basic arithmetic calculations for arriving dimensional parameters as per drawing.</p> <p>12.2 Apply basic financial calculation to understand cost of materials &amp; labour and basic concepts of profit/loss,</p> <p>12.3 Engage in basic banking transactions as customer</p>
<p>13. Explain time management, entrepreneurship and manage/organize related tasks in day to day work for personal &amp; social growth.</p>	<p>13.1 Ascertain appropriate time for the assigned task.</p> <p>13.2 Execute the assigned task within the time frame.</p> <p>13.3 Manage own work within specified time.</p> <p>13.4 Explain importance &amp; factors that affect the development of entrepreneurship.</p> <p>13.5 Identify service providers for developing entrepreneur/ business establishments.</p>