



# GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Vocation

Level: Under Graduate

Branch: Food Processing and Quality Control

Subject Code: BV02009031

Subject Name: Food Processing Technology

|                         |              |
|-------------------------|--------------|
| w. e. f. Academic Year: | 2024-25      |
| Semester:               | 2            |
| Category of the Course: | Core Courses |

|                      |  |
|----------------------|--|
| <b>Prerequisite:</b> | NA   |
| <b>Rationale:</b>    | This course provides an in-depth understanding of the food processing industry, focusing on post-harvest processing and value addition to fruits, vegetables, and beverages. It emphasizes modern techniques in preservation, juice processing, and the production of jams, jellies, and tomato-based products. Additionally, students learn about beverage manufacturing, including coffee and tea processing. The course aims to equip students with the skills and knowledge required to optimize food processing operations and explore new opportunities for growth in the food industry, both in India and globally. |

## Course Outcome:

After Completion of the Course, Student will able to:

| No | Course Outcomes  |
|----|--|
| 01 | Thorough understanding of the current state and future prospects of the food processing industries, both in India and internationally. |
| 02 | Post-harvest handling and processing of fruits and vegetables, including advanced techniques for juice extraction and preservation.    |
| 03 | Expertise in manufacturing jams, jellies, marmalades, and various tomato-based products  |
| 04 | Proficient in the production and processing of beverages.  |

## Teaching and Examination Scheme:

| Teaching Scheme<br>(in Hours) |   |    | Total Credits<br>L+T+ (PR/2) | Assessment Pattern and Marks |             |                      |         | Total<br>Marks |
|-------------------------------|---|----|------------------------------|------------------------------|-------------|----------------------|---------|----------------|
| L                             | T | PR | C                            | Theory                       |             | Tutorial / Practical |         |                |
|                               |   |    |                              | ESE (E)                      | PA / CA (M) | PA/CA (I)            | ESE (V) |                |
| 3                             | 0 | 0  | 3                            | 50                           | 0           | 0                    | 0       | 50             |



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## Course Content:

| Unit No.     | Content  | No. of Hours | % of Weightage |
|--------------|--|--------------|----------------|
| 1.           | Status of food processing industries in India and abroad, magnitude and inter-dependence of dairy and food industry, prospects for future growth in India.   | 8            | 20             |
| 2.           | Harvesting, transportation and storage of fruits and vegetables. Post harvest processing of fruits and vegetables: Peeling, sizing, blanching, Canning of fruits and vegetables, Drying and freezing of fruits and vegetables.   | 8            | 20             |
| 3.           | Juice processing: General steps in juice processing, role of enzymes in fruit. Juice extraction, equipment's and methods of fruit juice extraction, preservation of fruit juices, fruit juice clarification, concentration of fruit juices, fruit juice powders. Fruit juice processing; Orange and tangerine, Lemon and lime juice, Apple juice, Grape juice, Nectars, pulpy juices, tropical blends, Vegetable juices. | 10           | 20             |
| 4.           | Manufacture of Jam, Jelly and Marmalade: Role played by pectin, sugar and acid in jellied fruit products. Fruits and vegetable preserves, Glazed, Crystallized fruits. Tomato based products: Juice, puree, paste, sauce, ketchup. Pickles: Principle of pickling, technology of pickles.  | 10           | 20             |
| 5.           | Beverages: Classification, scope, carbonated non-alcoholic beverages and their manufacture. Fruit beverages and drinks, additives for fruit-based beverages. Coffee: Production practices, structure of coffee/cherry, Coffee processing including roasting, grinding, brewing extraction, dehydration, aromatization, instant coffee. Tea: Tea leaf processing, green, red, yellow, instant tea.                        | 9            | 20             |
| <b>Total</b> |  | <b>45</b>    | <b>100</b>     |

## Suggested Specification Table with Marks (Theory):

| Distribution of Theory Marks |         |         |         |         |         |
|------------------------------|---------|---------|---------|---------|---------|
| R Level                      | U Level | A Level | N Level | E Level | C Level |
| 20                           | 20      | 20      | 10      | 15      | 15      |



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*Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)*

## **References/Suggested Learning Resources:**

### **(a) Books:**

1. "Food Processing Technology: Principles and Practice" by P.J. Fellows
2. "Postharvest Technology of Fruits and Vegetables" by L. R. Verma and V. K. Joshi
3. "Fruit and Vegetable Juice Processing Technology" by Gaurav Rajauria and Brijesh K. Tiwari.
4. "Technology of Fruits and Vegetable Processing" by N. L. Kent and A. D. Evers
5. "Beverage Quality and Safety" by Tammy Foster and Paola Calza

### **(b) Open-source software and website:**

1. **Food and Agriculture Organization (FAO)** - <http://www.fao.org/home/en/> Offers resources on food processing, post-harvest management, and global trends in the food industry.
2. **FSSAI (Food Safety and Standards Authority of India)** - <https://fssai.gov.in/> Provides regulations and guidelines on food processing, preservation, and quality control in India.
3. **National Horticulture Board (NHB)** - <http://nhb.gov.in/> A resource for information on the harvesting, storage, and post-harvest processing of fruits and vegetables.
4. **Codex Alimentarius** - <http://www.fao.org/fao-who-codexalimentarius/> International standards for fruit and vegetable processing, including juice and beverage production.
5. **Science Direct** - <https://www.sciencedirect.com/> An open-access platform offering research articles and case studies on food processing technologies.
6. **Pub Chem** - <https://pubchem.ncbi.nlm.nih.gov/> Provides chemical and technical information relevant to additives, pectin, enzymes, and preservatives used in fruit and vegetable processing.
7. **Open Wet Ware** - <https://openwetware.org/> Contains protocols and resources for research and development in food science, including fermentation and beverage production.

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