



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Vocation

Level: Under Graduate

Branch: Food Processing and Quality Control

Subject Code: BV04009031

Subject Name: Recent Advances in Fruits and Vegetable Processing

w. e. f. Academic Year:	2025-26
Semester:	04
Category of the Course:	Core Course

Prerequisite:	Basic knowledge of Fruits and Vegetable Processing
Rationale:	To familiarize and empower students with the processing of fruits and vegetables, emphasizing recent technological advances and the design features of modern processing equipment.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes
01	Identify the basic structure and importance of engineering properties of fruits and Vegetables.
02	Understand different physical, thermal, frictional and aerodynamic properties of fruits and vegetables and its application in food processing operations.
03	Discriminate between various fruits and vegetables based on its rheological state such Newtonian and non-Newtonian fluids.
04	Develop food equipment based on thermal, electrical and magnetic properties of fruits and vegetables

Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2) C	Assessment Pattern and Marks				Total Marks
L	T	PR		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.	Physiology and Post-Harvest Aspects of Fruits and Vegetables <ul style="list-style-type: none">• Physiology of Development, Ripening, and Senescence of Fruits and Vegetables• Harvesting Methods and Harvesting Indices of Fruits and Vegetables• Post-Harvest Changes in Fruits and Vegetables• Technological Advances in Thermal Processing of Fruits and Vegetables	06	13
2.	Minimal Processing and Fresh-Cut Fruits & Vegetables <ul style="list-style-type: none">• Minimal Processing Technology• Fresh-Cut Produce• Quality Parameters of Fresh-Cut Fruit and Vegetable Products• Safety Aspects of Fresh-Cut Fruits and Vegetables• Enzymatic Effects on Flavor and Texture of Fresh-Cut Fruits and Vegetables• Preservative Treatments for Fresh-Cut Fruits and Vegetables• Application of Packaging and Modified Atmosphere to Fresh-Cut Fruits and Vegetables• Storage and Handling of Fresh Produce	10	22
3.	Edible Coatings for Fruits <ul style="list-style-type: none">• Edible Coatings for Fruits• Selection of Edible Coatings• Gas Permeation Properties of Edible Coatings• Wettability and Coating Effectiveness• Determination of Diffusivities in Fruits• Measurement of Internal Gas Composition of Fruits	09	20
4.	Recent Techniques in Fruit and Vegetable Processing <ul style="list-style-type: none">• Microwave and Radio Frequency Processing• Ohmic and Inductive Heating• High-Pressure Processing (HPP) and Pulsed Electric Field (PEF) Technology• High Voltage Arc Discharge and Pulsed Light Technology	10	22



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	<ul style="list-style-type: none">Oscillating Magnetic Fields and Ultrasonics		
5.	Quality and Safety of Fruits and Vegetables <ul style="list-style-type: none">Quality Attributes of Fresh Fruits and VegetablesQuality Indices of Fruit and Vegetable JuicesMaturity and Ripeness Indices of Fruits and VegetablesMicrobiology of Fresh and Processed Fruit and Vegetable Products and Advances in By-Product Utilization	10	23
	Total	45	100

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
15	10	10	15	0	0

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) Sumanbhatti & Uma Varma. 1995. Fruit and Vegetable Processing. CBS.
- 2) Mircea Enachescu Danthy. 1997. Fruit and Vegetable Processing. International Book Publ.
- 3) Cruess WV. 2000. Commercial Fruit and Vegetable Products. Agrobios.
- 4) P. Fellows. Food Processing Technology
- 5) Thompson AK. 1996. Post Harvest Technology of Fruits and Vegetables. Blackwell.
- 6) Verma LR & Joshi VK. 2000. Post Harvest Technology of Fruits and Vegetables. Vols. I-II. Indus Publ.

(b) Open-source software and website:

Websites

- 1) <https://agrimoon.com/wp-content/uploads/Engineering-Properties-of-Biological-Materials-and-FoodQuality.pdf>
- 2) https://ecourses.icar.gov.in/e-Learningdownload3_new.aspx?Degree_Id=04
