GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Engineering

Level: UG

Branch: Food Engineering & Technology

Subject Code: 3175103

Subject Name : Advanced Food Process Engineering

WEF Academic Year :	2022-23
Semester :	7
Category of the Course :	Professional Core

Prerequisite:Nil

Rationale: This subject equips students with advanced concepts of food processing operations, equipment design, and process optimization to enhance product quality, efficiency, and safety. It prepares them for modern food industry challenges and technology-driven processing solutions.

Course Scheme:

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
				Theory		Practical		
L	T	P	C	ESE (E)	PA(M)	ESE (V)	PA (I)	
4	0	2	5	70	30	30	20	150

Course Content:

Sr. No.	Course Content	No. of Hours	% of Weightage
1	Thermal processing: Death rate kinetics, thermal process calculations, methods of sterilization and equipments involved latest trends in thermal processing.	5	15
2	Evaporation: Properties of liquids, heat and. mass balance in single effect and multiple effect evaporator, aroma recovery, equipments and applications	7	15
3	Drying: Rates, equipments for solid, liquid and semi-solid material and their applications, theories of drying, novel dehydration techniques. Non-thermal processing: Microwave, irradiation, ohmic heating, pulsed electric field preservation, hydrostatic pressure technique etc.	10	20
4	Freezing: Freezing curves, thermodynamics, freezing time calculations, equipments, freeze drying, principle, equipments.	8	15
5	Separation: Mechanical filtration, membrane separation, centrifugation, principles, equipments and applications, latest developments in separation and novel separation techniques.	8	20
6	Extrusion: Theory, equipments, applications. Distillation and leaching: Phase equilibria, multistage calculations, equipments, solvent extraction.	6	15

Reference Book:

1. Post Harvest Physiology of Perishable Plant Products. By Stanley J. Kays. C B S.
2. Preservation of Fruits and Vegetables. By Girdharilal, Sidhappa G.S. and G.L. Tondon.
3. Commercial Fruits and Vegetables Products, By Cruess W.V.
4. Technology of Juice Manufacture, By Tressler.

Suggested Course Practical List:

- Solving problems on single and multiple effect evaporator,
- Solving problems on distillation and crystallization,
- Solving problems on extraction and leaching,
- Solving problems on membrane separation and mixing,
- Experiments on rotary flash evaporator, humidifiers, reverse osmosis and ultra filtration
- Design of plate and packed tower,
- Visit to related food industry.

List of Laboratory/Learning ResourcesRequired:

Equipment:

- Rotary evaporator
- Humidifier
- RO and UF filter

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