

GUJARAT TECHNOLOGICAL UNIVERSITY

Food Processing & Technology

B. E. SEMESTER: VI

Subject Name: **Food Process Equipment Design**

Subject Code: **161401**

Teaching Scheme				Evaluation Scheme		
Theory	Tutorial	Practical	Total	University Exam (Theory) (E)	Mid Sem Exam (Theory) (M)	Practical (I)
4	2	0	6	70	30	50

Sr. No	Course Content	Total Hrs.
1.	Design Consideration: Introduction, stresses created due to static and dynamic loads, design stress, elastic instability, combined stresses and theories of failure, brittle fracture, creep, temp effects, radiation effects, effects of fabrication methods.	8
2.	Heat Exchangers: Introduction, Types of Heat Exchangers, Design of Shell and Tube Heat Exchangers, Plate Heat Exchangers, Design problems.	07
3.	Pressure Vessel Design: Introduction, Operating Conditions, Design conditions and stress, Design of shell and its component, Stresses from local load and thermal gradient, Design problems.	07
4.	Evaporators: Evaporators, Types of Evaporators, Entrainment Separators, Materials of Construction Design\Consideration, Design Problems.	06
5.	Agitators: Introduction, Types of Agitators, Baffling, Power Requirements for Agitation, Design of Agitation System Components, Drive for Agitation, Design Problems.	07
6.	Dryers: Structural and thermal design, selection of dryer.	04

7.	Process Hazards and Safety Measures in Equipment Design: Introduction, Hazards in Process Industries, Analysis of Hazards, Safety Measures, Safety Measures in Equipment Design, Pressure Relief Devices.	06
8.	Handling Equipments: Design considerations and design problem of chain conveyor, belt conveyor, bucket elevator, screw conveyor.	07

Reference Books:

1. Process Equipment Design by Joshi MV and Mahajani VV. Macmillan India Ltd
2. Process Equipment Design by Brownell and Young. John Willey
3. Process Equipment Design by Bhattacharya BC. Macmillan India Ltd
4. Strength and Elasticity of Materials by Brooks WH. Asia Publishing House