

Gautam Buddha University; Greater Noida

School of Engineering (Mechanical Engineering)

Degree	Course Name	Course Code	Marks:100
M. Tech. in Design Engg.	Design of Process Equipments	MED 609	SM+MT+ET 25+25+50
Semester	Credits	L-T-P	Exam.
III	3	3-0-0	3 Hours

Unit - I

Introduction: Introduction to process equipments; Basics of process design; Design parameters: loading; Stress concentration and stresses/thermal stresses; Factor of safety; Material selection; Failure criteria; Shell thickness; Shell joints; Joint efficiency; Optimization technique and introduction to design codes. **(08 Hours)**

Unit - II

Design of Tall Vessels and Large Storage Tanks: Determination of equivalent stress under combined loadings including seismic and wind loads; Design of storage vessels. **(08 Hours)**

Unit - III

Design of Heat Exchanging; Mixing/Separating Equipments: Design of agitators and mixers; Filters and driers; Centrifuges; Heat exchangers. **(08 Hours)**

Unit - IV

Design of Pump and Compressor: Selection and specification procedures for impeller pumps and compressors; Design of rotodynamic pumps; Compressors; Applications of CAD to pump and compressor. **(09 Hours)**

Unit - V

Process Controls: Fundamentals of process measurements and their control; Design of control devices. **(06 Hours)**

Unit - VI

Miscellaneous: Planning; Manufacturing; Erection and inspection of process equipments. **(06 Hours)**

Recommended Books:

1. Process Equipment Design; M. V. Joshi; Mc-Millan.
2. Process Equipment Design; Browell and Young; John Wiley.
3. Plant Design and Economics; Max and Timasulaus Kalus; McGraw Hill.
4. Handbook of Instrumentation and Control; Kellen Heward; McGraw Hill.
5. Industrial Pipe Work; D.N.W. Kentish; McGraw Hill.
6. Pressure Vessel Design Hand Book; H. Bedna.
7. Process System Analysis and Control; D.R. Coughanowr; McGraw Hill; New York.
8. Engineering Optimization: Theory and Practice; S. S. Rao; New Age Publishing Co.; New Delhi.