

# **Gautam Buddha University, Greater Noida**

## **School of Engineering (Mechanical Engineering)**

<b>Degree</b>	<b>Course Name</b>	<b>Course Code</b>	<b>Marks:100</b>
M. Tech. in Design	Design of Process Equipments	MED 609	SM+MT+ET 25+25+50
<b>Semester</b>	<b>Credits</b>	<b>L-T-P</b>	<b>Exam.</b>
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.