



ChE 471: Equipment Design

3 credit hour, 3 contact hour lecture, 3 credit hour Eng.

Instructor

Instructor: Dr. Mohammed Azzam

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Textbooks & References

A. Textbook

	Textbook 1
Title	Plant Design and Economics for Chemical Engineers
Author(s)	M.S. Peters, K.D. Timmerhaus, and R. E. West
Publisher	McGraw-Hill
Year	2003
Edition	5th

B. References

1. "Coulson & Richardson's Chemical Engineering, Volume 6, Chemical Engineering Design", by R.K. Sinnott, Pergamon Press, 4th edition, 2005.
2. "Applied Process Design for Chemical and Petrochemical Plants", by Ernest E. Ludwig, Gulf Publishing Company, Houston, USA, Vol. 1,2 and 3 (1995, 1997 and 2001).
3. "Perry's Chemical Engineers Handbook", by D.W. Green & R.H. Perry. McGraw-Hill Book Company, 8th edition, 2007.

Specific Course Information

A. Course Catalog:

Selection of materials of construction. Design of pipes and pumping systems, compressors, tanks, pressure vessels, storage equipment, heat exchangers, and plate and packed towers.

B. Prerequisites or co-requisites

CHE 312 – Materials Science and Engineering

CHE 463 – Separation Processes

C. Required, Elective or Selected Elective

Required

Objectives and Outcomes*

1. You can design pumping systems (including design of pipes and pumps). [1,2,4]
2. You can design compressors (i.e. type of compressor to be used; fill-up and/or understand specification sheet of reciprocating compressors). [1,2]
3. You can design tanks (including filling-up specification sheet of tanks). [1,2,4]
4. You can design heat exchangers (including the detailed design of the inside of shell and tube heat exchangers). [1,2]
5. You can do basic selection of material of construction for industrial equipment. [1,2,4]
6. You can do a cost estimation of equipment covered in the course. [1,2,4]
7. You have acquired more engineering sense related to design in general and industrial equipment in specific. [1,2,4,7]

* Number in brackets refer to the Program outcomes

8. You gain a better understanding of professional and ethical responsibility versus design. [4]
 9. You recognize the need for life-long learning. [7]
 10. You recognize safety needs. [2]
 11. You gain experience in working as part of a team. [5]

Contribution of Course to Meeting the Professional Component

Relationship to Student Outcomes (%)

1	2	3	4	5	6	7
40	40	-	8	6	-	6

Relationship to Chemical Engineering Program Objectives

PEO1	PEO2	PEO3	PEO4	PEO5	PEO6
Y	Y	Y	-	-	-

Topics Covered

- Materials of Construction
- Pipes and Pumps
- Compressors
- Tanks, Pressure Vessels and Storage Equipment
- Heat Transfer Equipment
- Mass Transfer Equipment

Evaluation

<u>Assessment Tool</u>	<u>Expected Due Date</u>	<u>Weight</u>
Homework & Quizzes	One week after homework problems are assigned	10%
First Exam	According to the schedule posted by the Department	25 %
Second Exam	According to the schedule posted by the Department	25 %
Final Exam	According to the schedule posted by the University for the finals' exams	40 %