



Jordan University of Science and Technology
Faculty of Engineering
Chemical Engineering Department

CHE575 Plant Design - JNQF Level: 7

Second Semester 2023-2024

Course Catalog

3 Credit Hours. Process design development, general plant design considerations, health and safety, environmental factors, plant location and plant layout, computer aided design, economic principles including cost estimation, design optimization, report writing, codes of ethics, case studies.

Teaching Method: On Campus

Text Book

Title	Plant Design and Economics for Chemical Engineers
Author(s)	M.S. Peters, K.D. Timmerhaus, and R. E. West
Edition	5th Edition
Short Name	Textbook
Other Information	2003

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref #1	Preliminary Chemical Engineering Plant Design	W.D. Baasel	1st Edition	1974
Ref #2	Analysis, Synthesis, and Design of Chemical Processes	R. Turton, R.C. Bailie, W.B. Whiting, and J.A. Shaeiwitz	2nd Edition	2002
Ref #3	Applied Process Design for Chemical and Petrochemical Plants	Ernest E. Ludwig	3rd Edition	Vol. 1, 2, and 3 - -- 2007/2010/2015
Ref #4	The Chemical Engineers Handbook	R.H. Perry and D.W. Green	8th Edition	2008
Ref #5	Coulson & Richardson's Chemical Engineering, Volume 6, Chemical Engineering Design	J. F. Richardson J. H. Harker, and J. R. Backhurst	2nd Edition	

Ref #6	Plant Design and Cost Estimation	6. American Institute of Chemical Engineers	1st Edition	
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Instructor	
Name	Prof. Mohammed Osama Azzam
Office Location	CH2 L2
Office Hours	
Email	azzam@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun, Tue, Thu : 13:30 - 14:30 Room: CH2109

Prerequisites		
Line Number	Course Name	Prerequisite Type
224012	CHE401 Engineering Economy	Prerequisite / Study
224712	CHE471 Equipment Design	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	Topic	References
Week 1	Introduction	From Textbook, From Ref #1
Week 1	Plant Design Project Steps	From Textbook, From Ref #1, From Ref #2
Week 2	Preliminary Design	From Textbook, From Ref #1
Week 2	Feasibility Survey	From Textbook, From Ref #1

Week 2	Literature Survey	From Textbook , From Ref #1 , From Ref #2
Week 3	Plant Location	From Ref #1
Week 4	Health and Safety Hazards	From Textbook , From Ref #1 , From Ref #2
Week 5	Environmental Issues	From Textbook , From Ref #1 , From Ref #2
Week 6	Plant Layout	From Textbook , From Ref #1
Week 7	Computer Aided Design	From Textbook , From Ref #2
Weeks 7, 8	Cost Estimation	From Textbook , From Ref #2 , From Ref #3 , From Ref #4 , From Ref #5 , From Ref #6

Weeks 8, 9, 10, 11, 12	Plant Design Economics: Interest; Capitalized Cost; Present Value; Taxes; Insurance; Depreciation; Profitability and Profit Indicators	From Textbook , From Ref #2 , From Ref #3 , From Ref #4 , From Ref #5 , From Ref #6
Week 13	The Design Report	From Textbook
Weeks 14, 15	HAZOP study Reports' Presentations	From Textbook

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Apply the knowledge of the steps of plant design. [50SO1] [1L7K1]	21%	
Decide on plant locations and plant layout for chemical industries. [20SO4] [1L7S2]	10%	
Apply health and safety issues versus plant design. [40SO2] [1L7S3]	10%	
Account for environmental concerns and pollution treatment in the design of chemical plants. [40SO4] [1L7S2]	10%	
Estimate total project cost and its profitability. [30SO1] [1L7C1]	27%	
Write technical reports for design projects. [100SO3] [1L7S1]	2%	
Recognize professional and ethical responsibilities in design problems. [100SO4] [1L7K1]	5%	
Recognize the need for life-long learning. [100SO7] [1L7C1]	5%	
Perform HAZOP study on a chemical process. [20SO5] [1L7C1]	10%	

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7
48	10	2	25	10		5

Relationship to NQF Outcomes (Out of 100%)				
L7K1	L7S1	L7S2	L7S3	L7C1
26	2	20	10	42

Evaluation

Assessment Tool	Weight
Exam 1	25%
Exam 2	25%
Homework, Quizzes and Projects	10%
Final Exam	40%

Policy	
Attendance	Attendance will be checked at the beginning of class. University regulations will be followed for students exceeding the maximum number of absences.
Homework	Homework problems are assigned during lecture and usually due one week later. Late homework may not be accepted or severely penalized. Try to solve the problems independently. The assigned problems will be collected, graded, and returned to you in the lecture.
Quizzes	Quizzes will be part of this course. No make-up quizzes will be conducted except in the case of a documented emergency.
Student Conduct	It is the responsibility of each student to adhere to the principles of academic integrity. Academic integrity means that a student is honest with him/herself, fellow students, instructors, and the University in matters concerning his or her educational endeavors. Cheating will not be tolerated in this course. University regulations will be pursued and enforced on any cheating student.

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