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

CHE362 Unit Operations - JNQF Level: 7
First Semester 2024-2025

Course Catalog
3 Credit Hours. Characterization of solid particles, storage of solids, drag and drag coefficients, flow through beds of solids, mechanics of particle motion, settling, fluidization, size reduction, screening, filtration, gravity sedimentation processes, separation by centrifuges, separation by cyclones, evaporation.
Teaching Method: On Campus

Text Book	
Title	Unit Operations of Chemical Engineering
Author(s)	McCabe W.L., Smith J.C. and Harriot, P.
Edition	7th Edition
Short Name	Textbook
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref #1	Transport Processes and Separation Process Principles	Geankoplis C.J.	4th Edition	
Ref #2	Chemical Engineering; Volume 2	Coulson J.M., Richardson J.F., Backhurst J.R. and J.H. Harker	4th Edition	
Ref #3	Chemical Engineers' Handbook	Perry J. H.	8th Edition	
Ref # 4	Introduction to Particle Technology	Martin Rhodes	2nd Edition	Wiley, 2008

Instructor

Name	**Prof. Mohammad Al Harahsheh**
Office Location	-
Office Hours	
Email	msalharahsheh@just.edu.jo

Class Schedule & Room

Section 1:
  Lecture Time: Sun, Tue, Thu : 13:30 - 14:30
  Room: CH2111

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
223451	CHE345 Heat Transfer	Pre./Con.

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Weeks 1, 2	Introduction & Properties of Particulate Solids	From **Textbook**
Week 3	Size reduction	From **Textbook**
Week 4	Drag and drag coefficients	From **Textbook**
Week 5	Flow through beds of solids	From **Textbook**
Week 6	Mechanics of particle motion	From **Textbook**
Week 7	Settling	From **Textbook**
Weeks 8, 9	Fluidization	From **Textbook**
Weeks 10, 11	Filtration	From **Textbook**
Week 12	Gravity sedimentation processes	From **Textbook**
Week 13	Separation by centrifuges	From **Textbook**
Week 14	Evaporation	**Chapter 8** From **Ref #1**
Week 15	Floatation	

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Analyze particle size distribution and other physical properties of particulate solids [1SO1] [1L7K1]	16%	
Solve fluid flow problems in fixed and fluidized beds [1SO2] [1L7S1]	20%	
Recognize the principles of free and hindered settling [1SO1] [1L7K1]	8%	

Estimate energy requirements in size reduction operations [1SO2] [1L7S1]	14%	
Apply the principles of cake filtration to size industrial filters [1SO1] [1L7K1]	14%	
Solve gravitational and centrifugal settling problems [1SO2] [1L7S1]	20%	
Perform energy and material balances to single effect evaporators [1SO2] [1L7S1]	8%	

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7
38	62					

Relationship to NQF Outcomes (Out of 100%)	
L7K1	L7S1
38	62

Evaluation	
Assessment Tool	Weight
First Exam	25%
Second Exam	25%
Performance	10%
Final Exam	40%

Policy	
Attendance	Attendance will be checked at the beginning of each class. University regulations will be strictly followed for students exceeding the maximum number of absences.
Homework	Working homework problems is an essential part of this course and they represent a key opportunity to learn the subjects discussed. All homework problems assigned during lecture and usually due one week later unless otherwise stated. Late homework will not be accepted. Try to solve the problems independently. The assigned problems will be collected, graded, and returned to you in 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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