



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

CHE364 Mass Transfer - JNQF Level: 7

First Semester 2023-2024

**Course Catalog**

3 Credit Hours. Molecular diffusion. Mass transfer coefficients. Mass transfer across interface. Analogy between momentum, heat and mass transfer. Continuous and stage-wise processes. Equipment for gas-liquid mass transfer operations. Absorption.

**Text Book**

<b>Title</b>	Transport Processes and Unit operations
<b>Author(s)</b>	C.J. Geankoplis, A.A. Hersel & D.H. Lepek
<b>Edition</b>	5th Edition
<b>Short Name</b>	Textbook
<b>Other Information</b>	John Wiley & Sons, 2018

**Course References**

Short name	Book name	Author(s)	Edition	Other Information
Ref # 1	Fundamentals of Momentum, Heat and Mass Transfer	J. R. Welty, G.L. Rorrer, and D.G. Foster	7th Edition	John Wiley & Sons, 2019
Ref # 2	Separation Process Principles	J.D. Seader, E.J. Henley, D.K. Roper	4th Edition	John Wiley & Sons, 2015
Ref # 3	Unit Operations of Chemical Engineering	W.L. McCabe, J.C. Smith, and P. Harritt	7th Edition	McGraw-Hill Education, 2005
Ref # 4	Mass Transfer Operations	R. E. Treybal	3rd Edition	McGraw-Hill Education, 1980.

**Instructor**

Name	<b>Prof. Mohammed Al-Saleh</b>
Office Location	CH2L2-3

Office Hours	Sun : 09:30 - 10:30 Sun : 11:30 - 12:30 Mon : 08:30 - 10:30 Tue : 09:30 - 10:30 Thu : 08:30 - 10:30
Email	mhsaleh@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun, Tue, Thu : 12:30 - 13:30 Room: CH2111

Prerequisites		
Line Number	Course Name	Prerequisite Type
223451	CHE345 Heat Transfer	Prerequisite / Study
223410	CHE341 Thermodynamics For Chemical Engineering	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	Topic	References
Week 1	Introduction to Mass Transfer	From <b>Textbook</b> , From <b>Ref # 1</b> , From <b>Ref # 2</b>
Weeks 2, 3, 4, 5	Molecular Diffusion	From <b>Textbook</b> , From <b>Ref # 2</b>
Week 6	Unsteady-state Mass Transfer	From <b>Textbook</b> , From <b>Ref # 1</b>
Weeks 6, 7, 8, 9	Convective Mass Transfer	From <b>Textbook</b> , From <b>Ref # 1</b>
Week 10	Mass Transfer Between Phases	From <b>Textbook</b> , From <b>Ref # 1</b>
Weeks 11, 12, 13, 14	Absorption and Stripping	From <b>Textbook</b> , From <b>Ref # 1</b> , From <b>Ref # 2</b>
Week 15	Presentations & Review	

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Describe the fundamental principles and mechanisms of mass transfer [20SO1] [20L7K1]	10%	Project, Final Exam

Estimate the rate of diffusion for equimolar counter diffusion and unidirectional diffusion systems [10SO1] [10L7K1]	12%	Exam #1, HW
Estimate diffusion coefficients for gases and liquids [10SO1] [10L7K1]	7%	Exam #1, HW
Estimate rate of diffusion in solids [5SO1] [5L7K1]	7%	Exam #1, HW
Solve unsteady-state diffusion problems using convenient charts and Fourier series solutions. [10SO1] [10L7K1]	7%	Exam #2, HW
Estimate mass transfer coefficient [10SO1] [10L7K1]	22%	Exam #2, Final Exam, HW
Analyze problems involving mass transfer between phases [10SO1] [10L7K1]	10%	Project, Final Exam
Design tray and packed absorption columns [20SO2] [1L7S3]	20%	Final Exam
Determine the safe operating conditions in absorption towers [5SO2] [1L7S3]	5%	Final Exam

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7
75	25					

Relationship to NQF Outcomes (Out of 100%)	
L7K1	L7S3
75	25

Evaluation	
Assessment Tool	Weight
Exam #1	20%
Exam #2	20%
Project	10%
Final Exam	40%
HW	10%

Policy	
Attendance	Attendance will be checked at the beginning of class. University regulations will be followed for students exceeding the maximum number of absences.
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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