



ChE 364: Mass Transfer

3 credit hour, 3 contact hour lecture, 3 credit hour Eng (1 hr design).

Instructor

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Textbooks & References

A. Textbook

	Textbook 1
Title	Transport Processes and Separation Process Principles
Author(s)	Christie Geankoplis
Publisher	Prentice Hall
Year	2003
Edition	4 th Edition

B. References

1. Fundamentals of Momentum, Heat and Mass Transfer by J. R. Welty, C. E. Wicks, and R. E. Wilson, 6th Edition, John Wiley & Sons, 2014
2. R. E. Treybal, Mass Transfer Operations, Third Edition, McGraw Hill, 1980
3. McCabe, W.L., J. Smith, and P. Harriott, *Unit Operations of Chemical Engineering*. 7th ed. 2005: McGraw-Hill Education.
4. Seader, J.D. and E.J. Henley, *Separation Process Principles* 2nd ed. 2005: Wiley.

Specific Course Information

A. Course Catalog:

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.

B. Prerequisites or co-requisites

ChE 345 and ChE 341

C. Required/Elective or Selected Elective Required

Objectives and Outcomes*

• Outcome	ABET
1. Describe the fundamental principles and mechanisms of mass transfer	1

* Number in brackets refer to the Program outcomes

2. Estimate the rate of diffusion for equimolar counter diffusion and unidirectional diffusion systems	1
3. Estimate diffusion coefficients for gases and liquids	1
4. Estimate rate of diffusion in solids	1
5. Understand the principles of unsteady-state diffusion	1
6. Model simple mass transfer systems	1
7. Analyze problems involving mass transfer between phases	1
8. Design tray and packed absorption columns	1,2
9. Recognize the safe operation conditions in absorption towers	1,2

Contribution of Course to Meeting the Professional Component

Relationship to Student Outcomes (%)

1	2	3	4	5	6	7
75	25					

Relationship to Chemical Engineering Program Objectives

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

Topics Covered

Chapter 1: Introduction to Mass Transfer

Chapter 2: Molecular Diffusion

Chapter 3: Unsteady Mass Transfer

Chapter 4: Convective Mass Transfer

Chapter 5: Mass Transfer between Phases

Chapter 6: Absorption

Evaluation

	Weight
Assignments ¹	10%
1 st Exam	25%
2 nd Exam	25%
Final exam	40%

¹ Late assignments will not be accepted