



ChE 565: Unit Operations Laboratory

1 credit hour, 3 contact hour lecture, 1 credit hour Engineering

Instructor

Instructor: Dr. Mohammed Al-Saleh

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Textbooks & References

A. Textbook

	Textbook 1
Title	Lab Manual
Author(s)	NA
Publisher	
Year	
Edition	

B. References

1. Geankoplis, Transport Processes and Separation Process Principles, 4th Edition, Prentice Hall PTR.
2. Henley, E.J., J.D. Seader, and D.K. Roper, Separation Process Principles 3rd ed. 2011: Wiley.
3. Wankat, P.C., Separation Process Engineering: Includes Mass Transfer Analysis, 3rd Ed. 2011: Prentice Hall PTR.
4. Harker, J.H., J.F. Richardson, and J.R. Backhurst, Coulson & Richardson's chemical engineering. 3rd ed. Vol. 2.
5. McCabe, W.L., J. Smith, and P. Harriott, Unit Operations of Chemical Engineering. 7th ed. 2005: McGraw-Hill Education.

Specific Course Information

A. Course Catalog:

Operating and analyzing the performance of eight pilot-plant setups representing different unit operations typically encountered in the chemical industry. Observing the processing behavior, collecting experimental data, and discussing the experimental results in professional reports. The experiments are distillation, absorption, extraction, tray drying, spray drying, fluidization, evaporation, and water-cooling towers.

B. Prerequisites or co-requisites

ChE 463 and ChE445

C. Required/Elective or Selected Elective

Required

Objectives and Outcomes*

1. Apply mass and energy balances, chemical engineering thermodynamics, heat transfer, and mass transfer concepts for analyses and design of unit operations [1,2,6]
2. Gain experience on operating and collecting data accurately from chemical processes [1,2,6]
3. Monitor the operation behavior of different unit operations from transient to steady-state [6]
4. Enhance students technical writing skills [3,5]
5. Gain experience on delivering oral presentations [3]
6. Train students on safe operation of chemical processes [2,4]

Contribution of Course to Meeting the Professional Component

Relationship to Student Outcomes (%)

1	2	3	4	5	6	7
20	30	20		20	20	

Relationship to Chemical Engineering Program Objectives

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

Topics Covered

Experiments

- Distillation
- Absorption
- Extraction
- Water Cooling Towers
- Tray Drying
- Spray Drying
- Fluidization
- Evaporation

Evaluation

	Due Date	Weight
Reports ¹	One week after completing the experiment	35%
Lab performance		10%
Midterm exam (Presentation)		15%
Final exam		40%

* Number in brackets refer to the Program outcomes