

Time and Place

10:30-11:20AM Monday-Wednesday-Friday

W55 Chemistry Building

NOTE: *Exams will be at different times*

Course Description

Mechanisms of diffusional and convective mass transfer; solution of industrial problems, including the design of distillation, extraction, absorption, leaching, humidification, adsorption, drying, and chromatography processes; mechanical separations.

Instructor

Eric Nuxoll

eric-nuxoll@uiowa.edu

4140 SC

Office Hours:

T 5:00-6:00, F 4:30-5:30,

or by appointment

Teaching Assistant

Sepehr Roudini

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G138 SC

Office Hours:

T 4:00-5:00

F 2:30-3:30

Discussion: M 5:30-6:20 in SC 3505

Required Text

Separation Process Principles, 3rd Edition

by J.D. Seader, E.J. Henley & D. K. Roper,

ISBN: 978-0-470-48183-7

Course Format

Lectures with weekly homework, one group project, three mid-term exams and a final exam. Each lecture should conclude with a minor quiz.

Grading

Course grade will be weighted as follows:

Homework: 18%

Project: 7%

Final Exam: 25%

Mid-term Exams: 15% each

Minor Quizzes: 5% collectively

Scheduling conflicts

Students anticipating a scheduling conflict should contact the instructor as soon as possible. Exams will be offered at alternative times as consistent with the University's exam policies. These policies can be viewed at www.registrar.uiowa.edu/exams/exampolicy.aspx

Accommodations for Disabilities

If you feel that you may need an accommodation based on the impact of a disability please contact Prof. Nuxoll privately to discuss your specific needs. You may also contact the Office of Student Disability Services (319/335-1462) to discuss the accommodations that are available for students with documented disabilities.

This course is housed in the College of Engineering, therefore class policies on matters such as requirements, grading, and sanctions for academic dishonesty are governed by the College of Engineering. <http://www.engineering.uiowa.edu/current-students/academic-policies> Students wishing to add or drop this course after the official deadline must receive the approval of the Dean of the College of Engineering. Details of the University policy of cross enrollments may be found at: <http://www.uiowa.edu/~provost/deos/crossenroll.doc>

Schedule

Below is a **ROUGH** outline of the course, with accompanying section of the text

Date	Topic	Text
August 22 (M)	Introduction	1.1 – 1.9
August 24 (W)	Fick's Laws	3.1
August 26 (F)	Differential Mass Balances	3.1
August 29 (M)	Steady-State Transport	3.3
August 31 (W)	Quasi-Steady-State Transport	3.1
September 2 (F)	Non-Steady-State Transport	3.3
September 5 (M)	UNIVERSITY HOLIDAY, NO LECTURE	
September 7 (W)	Non-Steady-State Transport	3.3
September 9 (F)	Diffusion Coefficients	3.2
September 12 (M)	Diffusion Coefficients	3.2
September 14 (W)	Partition Coefficients	2.2
September 16 (F)	Mass Transfer Correlations	3.4, 3.5
September 19 (M)	Mass Transfer Models	3.6
September 21 (W)	Review	
September 22 (Th)	MIDTERM EXAM #1 (6:30 – 8:30pm, SC 3505)	
September 23 (F)	Binary Vapor-Liquid Systems	4.2
September 26 (M)	Discussion of Midterm Exam #1	
September 28 (W)	Multi-component Vapor-Liquid Systems	4.4
September 30 (F)	CBE Professional Advisory Board Interviews	
October 3 (M)	Azeotropes	4.3
October 5 (W)	Liquid-Liquid Extraction	4.5, 4.6
October 7 (F)	Leaching/Washing	4.7
October 10 (M)	Adsorption	15.1, 15.2
October 12 (W)	Liquid-Solid Cascades	5.1, 5.2
October 14 (F)	Liquid-Liquid Cascades	5.3
October 17 (M)	Liquid-Vapor Cascades: Absorption	6.1, 6.2
October 19 (W)	Absorption: Kremser Method	5.4
October 21 (F)	Absorption: Graphical method	6.2, 6.3
October 24 (M)	Absorption: Algebraic method (Kremser revisited)	6.4
October 26 (W)	Review	
October 27 (Th)	MIDTERM EXAM #2 (6:30 – 8:30pm, SC 3505)	
October 28 (F)	Vapor-Liquid Cascade Stage efficiencies	6.5
October 31 (M)	Discussion of Midterm Exam #2	
November 2 (W)	Vapor-Liquid Cascade Sizing, Flooding	6.6
November 4 (F)	Vapor-Liquid Packed Columns	6.7, 6.8
November 7 (M)	ChemCAD Workshop	
November 9 (W)	ChemCAD Workshop	
November 11 (F)	Vapor-Liquid Packed Columns	6.7, 6.8
November 14 (M)	Binary Distillation	7.1, 7.2
November 16 (W)	Binary Distillation: Graphical Method	7.2
November 18 (F)	Distillation: Design Parameters	7.3 – 7.5
November 21 (M)	UNIVERSITY RECESS, NO LECTURE	
November 23 (W)	UNIVERSITY RECESS, NO LECTURE	
November 25 (F)	UNIVERSITY RECESS, NO LECTURE	
November 28 (M)	Distillation: Packed Columns	7.6
November 30 (W)	Multicomponent Distillation	9.1
December 2 (F)	Multicomponent Liquid-Liquid Extraction	8.1 – 8.3
December 5 (M)	Review	
December 6 (T)	MIDTERM EXAM #3 (6:30 – 8:30pm, SC 3505)	
December 7 (W)	Discussion of Midterm #3	
December 9 (F)	Review	
December XX (X)	FINAL EXAM (TBD, TBD)	