

Time and Place

8:30-9:20AM Monday-Wednesday-Friday

2229 Seamans Center for the Engineering Arts & Sciences

NOTE: *Exams will be at different times*

Course Description

Fundamentals of heat and mass transfer including heat exchanger design; conductive, convective, and radiative heat transfer; mechanisms of diffusional and convective mass transfer.

Instructor

Eric Nuxoll

eric-nuxoll@uiowa.edu

4140 SC

Office Hours:

T 6:00-7:00pm in *SC 2040*

F 4:00-5:00pm in SC 4140

or by appointment

Teaching Assistants

Alejandro Lira and Justin Zellinger

alejandro-lira@uiowa.edu

justin-zellinger@uiowa.edu

G138 SC

Office Hours:

M 2:30-3:30 (J. Zellinger, SC G138)

M 7:30-8:30pm (J. Zellinger, *SC 3505*)

T 7:00-8:00 (A. Lira, *SC 2040*)

F 2:30-3:30 (A. Lira, SC G138)

Required Text

Unit Operations of Chemical Engineering, 7th Edn.
by W.L. McCabe, J.C. Smith & P.

Harriott, ISBN: 978-0-07-284823-6

Course Format

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

Discussion Session

M 6:30-7:20 in SC 2217

Grading

Course grade will be weighted as follows:

Homework: 25%

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 and quizzes will be offered at alternative times as consistent with the University's exam policies. These policies can be viewed at <https://registrar.uiowa.edu/midterm-exam-policies>

Free Speech and Expression

The University of Iowa supports and upholds the First Amendment protection of freedom of speech and the principles of academic and artistic freedom. We are committed to open inquiry, vigorous debate, and creative expression inside and outside of the classroom. Visit the [Free Speech at Iowa website](https://freespeech.uiowa.edu) (freespeech.uiowa.edu) for more information on the university's policies on free speech and academic freedom.

Non-discrimination Statement

The University of Iowa prohibits discrimination in employment, educational programs, and activities on the basis of race, creed, color, religion, national origin, age, sex, pregnancy, disability, genetic information, status as a U.S. veteran, service in the U.S. military, sexual orientation, gender identity, associational preferences, or any other classification that deprives the person of consideration as an individual. The university also affirms its commitment to providing equal opportunities and equal access to university facilities. For additional information on nondiscrimination policies, contact the Director, [Office of Institutional Equity](#), the University of Iowa, 202 Jessup Hall, Iowa City, IA 52242-1316, 319-335-0705, oi-e-ui@uiowa.edu. Students may share their pronouns and chosen/preferred names in [MyUI](#), which is accessible to instructors and advisors.

Absences for Religious Holy Days

The University is prepared to make reasonable accommodations for students whose religious holy days coincide with their classroom assignments, test schedules, and classroom attendance expectations. Students must notify their instructors in writing of any such Religious Holy Day conflicts or absences within the first few days of the semester or session, and no later than the third week of the semester. If the conflict or absence will occur within the first three weeks of the semester, the student should notify the instructor as soon as possible. See [Operations Manual 8.2 Absences for Religious Holy Days](#) for additional information.

Accommodations for Disabilities

The University is committed to providing an educational experience that is accessible to all students. If a student has a diagnosed disability or other disabling condition that may impact the student's ability to complete the course requirements as stated in the syllabus, the student may seek accommodations through [Student Disability Services](#) (SDS, sds.studentlife.uiowa.edu/students/). SDS is responsible for making Letters of Accommodation (LOA) available to the student. The student must provide a LOA to the instructor as early in the semester as possible, but requests not made at least two weeks prior to the scheduled activity for which an accommodation is sought may not be accommodated. The LOA will specify what reasonable course accommodations the student is eligible for and those the instructor should provide. Additional information can be found on the [SDS website](#).

<p>The College of Engineering is the administrative home of this course and governs its add/drop deadlines, the second-grade-only option, and other policies.</p>

Schedule

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

Date	Topic	Text
August 21 (M)	Introduction	Section III
August 23 (W)	Modes of Heat Transfer	
August 25 (F)	Differential Heat Balances	Chapter 10
August 28 (M)	Steady-State Transport, single layer	
August 30 (W)	Steady-State Transport, multi-layer	
September 1 (F)	Steady-State Transport, multi-layer	NOTE: This 1/3
September 4 (M)	UNIVERSITY HOLIDAY, NO LECTURE	of course will be
September 6 (W)	Non-Steady-State Transport	augmented significantly
September 8 (F)	Non-Steady-State Transport	by material from other
September 11 (M)	Non-Steady-State Transport	sources.
September 13 (W)	Lumped analysis	
September 15 (F)	Lumped analysis	
September 18 (M)		
September 20 (W)	Review	
September 21 (Th)	MIDTERM EXAM #1 (6:30 – 8:30pm, SC 3505)	
September 22 (F)	Heat Exchangers	Chapter 11
September 25 (M)	Heat Exchangers	
September 27 (W)	Convective Heat Transfer, Forced Laminar	Chapter 12
September 29 (F)	Discussion of Midterm Exam #1	
October 2 (M)	Convective Heat Transfer, Forced Turbulent	
October 4 (W)	Convective Heat Transfer, Forced Transition	
October 6 (F)	Convective Heat Transfer, Natural	
October 9 (M)	Condensers	Chapter 13
October 11 (W)	Boilers	
October 13 (F)	Heat Exchangers	Chapter 15
October 16 (M)	Radiation	Chapter 14
October 18 (W)	Radiation	
October 20 (F)	Radiation	
October 23 (M)		
October 25 (W)	Review	
October 26 (Th)	MIDTERM EXAM #2 (6:30 – 8:30pm, SC 3505)	
October 27 (F)	Diffusion and Mass Transfer	
October 30 (M)	Numerical Methods	
November 1 (W)	Numerical Methods	
November 3 (F)	Discussion of Midterm Exam #2	
November 6 (M)	Steady-State Diffusion	Chapter 17
November 8 (W)	Unsteady-State Diffusion	
November 10 (F)	Pseudo-Steady-State Diffusion	
November 13 (M)	Unimolecular Diffusion	AGAIN, this 1/3 of
November 15 (W)	Partition Coefficients	the course will be
November 17 (F)	Diffusion Coefficients	augmented significantly
November 20 (M)	UNIVERSITY RECESS, NO LECTURE	by other sources
November 22 (W)	UNIVERSITY RECESS, NO LECTURE	
November 24 (F)	UNIVERSITY RECESS, NO LECTURE	
November 27 (M)	Mass Transfer Coefficients	
November 29 (W)	Mass Transfer Coefficients	
December 1 (F)	Mass Transfer Coefficients	
December 4 (M)	Review	
December 5 (T)	MIDTERM EXAM #3 (6:30 – 8:30pm, SC 3505)	
December 6 (W)	Discussion of Midterm #3	
December 8 (F)	Review	
December XX (X)	FINAL EXAM (TBD, TBD)	