Robert H. Davis
University of Colorado

Syllabus – CHEN 3211 – Mass Transfer – January 2025

Instructor: Robert H. Davis: robert.davis@colorado.edu
BIOT D127, 303-492-7314

Course Asst: Anna Broerman: anna.broerman@colorado.edu (Lead CA)

Class Meeting Times/Dates:
On-line asynchronous: January 6 – 12
In-person lectures: 5:10-6:30 pm January 13, 15, 17, 22, 24 & 27 in B115
Review session: 5:10-6:30 pm January 29 in B115

Office Hours:
The CA will hold office hours to help with homework and studying during the following times:
Tuesdays, January 14, 21 & 28, 11 am - 12 pm, B1B90
Thursdays, January 16, 23 & 30, 3-4 pm, E125
Friday, January 30, 5 – 6 pm, B115
Prof. Davis has office hours 3:15 – 4 pm Wednesdays, January 15, 22 & 29 ; 12 – 1 pm Saturday, February 1; and 3:15 – 4 pm Monday, February 3, all in D127
Email the CA or Prof. Davis with questions or to schedule individual meetings besides regular office hours.

Course Communication:
All pertinent information will be posted on Canvas including class materials, assignments, exam information, etc. You are responsible for everything that is posted there, including any updates.

Pre-requisites:
CHEN 3210 or equivalent course in Heat Transfer (grade of C- or better or instructor's consent)

Text: No text is required; lecture notes and screencasts will be provided

Final Exam: Monday, February 3, 5 - 7 pm, B115. The exam will be closed book and notes; an equation and data sheet will be provided for the exam and is posted on Canvas. Students may also bring their own sheet of notes, 8.5 × 11", handwritten on both sides. A portion of the exam (Part 1) will be closed to all notes. Students are to work alone on the exam.

CU Boulder Required Syllabus Statement:

https://www.colorado.edu/academicaffairs/policies-customs-guidelines/required-syllabus-statements

Assignments: All assignments will be posted on Canvas. Screencast quizzes will be due January 9 & 12 during the online portion. There will also be short quizzes during the in-person classes. Attendance is expected, and the in-class quizzes cannot be made up later. However, the lowest in-class quiz score and the lowest screencast quiz score will be dropped from the course grade. Homework will be due January 16, 23 & 30 at 11:59 pm via Gradescope. There will also be a practice exam due 4:00 pm on Saturday, February 1 via Gradescope. Students are expected to do the homework assignments and practice exam individually but may consult with classmates or the instructor or CA during office hours. The submitted

solutions must not be copied from a classmate or any other source. All three homework assignments and practice exam are required, and none of the scores will be dropped from the course grade calculation.

Grading: The grade weightings and equivalencies are listed below.

Screencasts & Quizzes:	10 %	A	85 – 100%
Homework Assignments:	20 %	B	75 – 85%
		C	65 – 75%
Practice Exam:	10 %	D	55 – 65%
Final Exam:	60 %	F	0 – 55%

The course grades will be based on work done during this intensive course and will be independent of prior grades in other courses.

Policies: Assignments that are submitted 10 – 60 min late will be marked down 10% and those submitted 61 – 120 min late will be marked down 20%. Assignments more than two hours late will not be graded, except short extensions (typically one day) may be granted for medical reasons if a request is submitted to the instructor at least six hours before the due time. Extra-time accommodations on exams and quizzes require formal approval in advance by the Office of Disability Services. Attendance at the in-person lectures is expected, and a short quiz will be given most days. Lectures will not be recorded, but written notes will be posted; for an excused absence from lecture, contact Prof. Davis about obtaining the lecture recording from a prior year. It is expected that safe and professional behavior be exhibited at all times. *Any discovered incidents of academic dishonesty will be reported* to the CU Honor Code Council. Consequences may include receiving a failing grade in the course.

The instructor, assistants and students in this course affirm the value of all individuals and agree to treat one another with equity and respect. Please see the college webpage for our commitment to diversity, equity and inclusion: https://www.colorado.edu/engineering/about/diversity-equity-and-inclusion.

Course Learning Goals:

1. Know mass-transfer definitions (concentrations, fluxes, etc.)
2. Perform mass balances to derive species continuity equations
3. Understand flux equations, Fick's law, and boundary conditions
4. Solve problems of equimolar, unimolecular, unsteady & pseudo-steady diffusion
5. Solve problems of diffusive mass transfer with reaction
6. Analyze convective mass transfer, including scaling analyses & correlations
7. Understand interfacial mass transfer between two fluid phases