

MSE 457/CHEM 480
“Polymer Chemistry”
Instructor: Prof. Christopher Evans
Fall Semester 2021
web page: Compass/Blackboard

Primary Textbook:

Polymer Chemistry, 3rd Edition, Hiemenz and Lodge

Optional Textbooks

- 1) *Polymer Chemistry, 3rd Edition*, Stevens
- 2) *Principles of Polymerization, 4th Edition*, G. Odian

Office Hours, TA, and instructor information

Instructor: Prof. Evans, cme365@illinois.edu, 217-300-9949

Office hours: TBD

TAs: Seongon Jang, Veronica Gerios

TA Office hours: TBD

Grading

Homeworks are worth 20% (~10 homeworks) and will be submitted on **Gradescope**. If you don't do the homework, you will likely have serious difficulties on the exams. Over the course of the semester, you are allowed to drop 2 HW for any reason. *Late homeworks will be accepted with a reduction of 10% per hour late.* Although you are encouraged to talk about the problems with your classmates, you must submit an original homework. **Homeworks which exhibit copying or plagiarism will receive zero points.**

You have **2 weeks to ask for a regrade on all HW and exams**. Students must first look at the posted solutions before requesting a regrade. Requests made on the same day that an assignment is handed back will not be accepted.

There will be **one midterm exam and one final** worth 25 and 35%. Weekly quizzes will be posted online and these will be worth 20% of the grade.

Course outline and corresponding book chapters (Hiemenz and Lodge)

Module 1: Introduction and nomenclature, Molecular weight definition, Organic Chemistry Review (*Chapter 1 of H&L*)

Module 2: Step growth polymers, branching and network formation, kinetics, interfacial polymerization, dendrimers (*Chapter 2 of H&L*)

Module 3: Chain growth polymerization, free radical polymerization, initiation, emulsions (*Chapter 3 of H&L, Chapter 4 of Odian*)

Module 4: “Living” radical methods (ATRP, NMCRP, RAFT), Anionic and Cationic polymerization, ring opening polymerization (*Chapter 4 of H&L*),

Module 5: Copolymers, microstructure, characterization, catalytic and stereocontrolled polymerization (*Chapter 5 of H&L*)

Module 6: Assorted current and emerging topics in polymer science (conductive polymers, solid state synthesis, sequence specific polymers, dynamic polymer networks, molecular cages, frontal polymerization)

Midterm 1: Friday, October 29, 11-11:50

Final Exam: Friday December 10, 1:30-4:30