

Polymer Chemistry (CBE:5315)
Course Outline- Fall 2022

COURSE DESCRIPTION: Polymer Chemistry provides broad overview of polymerization reactions including characterization, monomer structure, mechanisms, and polymer products.

COURSE OBJECTIVES: This course will provide an overview of polymer chemistry to provide the students a working knowledge of:

- Polymerization mechanisms, reactions, and kinetics
- Relationships among monomer reactivity, monomer structure, and polymer properties.
- Methods of polymer characterization
- Current research topics

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TEACHING ASSISTANT:
Adreann Peel
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CLASS: 2133 SC 9:30-10:20 am MWF
Tests: 2 scheduled from 6:30-8:30 pm on Tuesday, October 11 and Thursday, November 17 in 4030 SC. Final: 10:00 am – 12:00 pm on Monday, December 12.

OFFICE HOURS: I will be available weekly in my office from 11:30 am – 12:30 pm on Tuesdays, 1:30 – 2:30 pm on Thursdays, or by appointment. Zoom meetings are also possible by request.

TEXT: Principles of Polymerization, 4th Edition, G. Odian, Wiley, 2004

GRADING:

2 Exams	40%
Final	25%
Project	20%
Assignments	10%
Quizzes	5%

Exams. Exams will have both open and closed book sections with the emphasis on the open book section. Two mid-term exams will be given during the semester. Each of these exams will be two hours long and given outside of typical class times, most likely on Tuesday, Wednesday, or Thursday evenings. The final exam will be comprehensive and given during finals week.

Homework. Approximately 6-8 homework assignments will be given throughout the semester. Each assignment will be distributed at least one week before the due date. These assignments will build on concepts discussed in class and in the book. Students are encouraged to begin assignments early to allow time to ask questions before they are due. Assignments will be collected at the beginning of class on the due date. Late homework will not be accepted.

In grading homework (and exam) problems, emphasis will be on a correct approach to the problem. Discussion of homework problems with classmates is permitted; however, copying of solutions is not. The overall homework grade will be determined by first grading on whether a significant attempt was made at solving the problem for half of your grade. In addition, at least one problem per assignment will be graded in detail from which the other half of the grade will be determined.

Quizzes. Approximately 5-8 straightforward quizzes will be given throughout the semester with the lowest score dropped. They will be based on recent lectures and homework. Each quiz will be announced the class period beforehand unless class attendance warrants unannounced quizzes.

Project. The project will consist of a presentation on a specific aspect of polymer science. Connections to elements in the course must be included. The presentations will tentatively be 15 minutes each and given during the last few weeks of class.

STUDENT EXPECTATIONS: E-mail will be the primary mode of communication for the course. Students are expected to check e-mail regularly. Announcements, assignments, and due dates will be posted on ICON. Students are also expected to comply with University policies regarding appropriate classroom behavior as outlined in the [Code of Student Life](#).

LECTURES: The primary means for delivery will be lectures in the classroom. As needed for approved accommodations, lectures will be recorded as well. Additionally, some lectures will be prerecorded using Lightboard technology and posted on ICON.

CLASS OUTLINE

- I. Intro to Polymers: Structure, Tacticity, Molecular Weight, Molecular Weight Measurements and Properties – Ch. 1 (3 weeks)
- II. Step Polymerizations – Ch. 2 (2 weeks)
- III. Free Radical Chain Polymerizations – Ch. 3 (2 weeks)
- IV. Copolymerizations – Ch. 6 (1.5 weeks)
- V. Cationic/ Anionic Polymerizations – Ch. 5 (1.5 weeks)
- VI. Polymerization Methods – Ch. 4 (1.5 weeks)
- VII. Other Types of Polymerizations – Ch. 7-8 (1.5 weeks)

VIII. Project Presentations (2 weeks)

Some Notes on Academic Integrity and Misconduct

In this course, I will hold you to the high standard of academic integrity expected of all students at the university. I do this for two reasons. First, it is essential to the learning process that you are the one doing the work. I have structured the assignments in this course to enable you to gain a mastery of the course material. Failing to do the work yourself will result in a lesser understanding of the content, and therefore a less meaningful education for you. Second, it is important that there be a level playing field for all students in this course and at the university so that the rigor and integrity of the university's educational program is maintained. Some guidelines are provided below to explain various aspects of academic misconduct and sanctions that will be used in this course, as well as how you can still collaborate on homework assignments.

What is considered academic misconduct? (this list is not exhaustive, but provides you some common examples)

- Looking at the exam or quizzes of others, even if nothing is copied from them.
- Any communication with others during exams or quizzes (verbal, electronic, gestures, etc.).
- Copying answers from another exam paper or someone else's assignment.
- Using unapproved resources during an exam.
- Any use of unapproved resources to complete homework or in-class assignments, including any solution manual for the textbooks used in this course, previous year's homework solutions, completed assignments or exams from previous years, Chegg or similar online "services".

What are the consequences for academic misconduct in this course?

- Cheating on a midterm or final exam will result in an F in the course.
- Cheating on in-class activities or homework will result in a zero for this portion of the class (e.g. a zero for all homework and in-class activities).
- Cheating on projects or papers will result in a zero for the Ethical Case Studies, Demonstration Reviews, Jove Video Reviews, and Topical Papers portion of the class.
- If academic misconduct is suspected by the instructor, College of Engineering policies will be used to investigate and (if needed) take action in terms of repercussions against the student.
 - A discussion with the suspected student will be held. If the suspicion of academic misconduct cannot be cleared by the discussion, it will be documented in writing, a zero will be assigned to the appropriate portion of the class, and the documentation will be submitted to the Associate Dean for Academic Programs. The student may appeal to the Dean's office. For 2nd offenses, the Dean's office may take additional actions against the student (cancellation of the student's registration, disciplinary probation, suspension from the College, or recommendation of expulsion from the University).

What is appropriate collaboration on homework?

- Appropriate collaboration on homework is encouraged. Appropriate collaboration on homework is working together on the assignment, without viewing each other's written work. If you want to explain something to a friend, explain it verbally or use a spare sheet of paper and explain it using a separate example from the assigned problem. Rather than telling your friend the next step or the answer, ask them questions that will help them develop the solution logic themselves. Then let them apply that example to their own work.
- A good recommendation for collaboration on homework is to discuss how to do the problems, but to not actually look at completed work of your friends, until after you have fully worked out the problem yourself.
- Verbally comparing final answers is OK. Inspecting a friend's incomplete work to identify an error or recommend a next step in the problem is on the borderline of academic misconduct and should be done with caution. It should only be done (a) after you have completed the problem; (b) without sharing your written work; and (c) help should be given on the concepts underlying the problem; in other words, the answer should not be provided, and the detailed steps to the solution should not be provided. Instead, ask questions that might help correct your friend's thinking, or point to the general area of the problem where they are stuck or wrong and suggest work on "this portion" of the problem. If a term is negligible and your friend does not realize it, work with them and explain why the term is negligible and under what circumstances it might not be negligible.
- Each student should write out the final calculation for themselves, and calculate any quantities using their own calculator or spreadsheet. This includes excel calculations – while working together to get the basic idea of a numerical problem, the final parameter adjustments and graphs should be done individually. Otherwise, the person sitting at the computer may learn the most.

Cheating lowers the morale of all students and makes grading less fair. If you are aware of cheating, use of solution manuals, or academic misconduct, please report it to the instructor.

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 for more information on the university's policies on free speech and academic freedom.

Accommodations for Students with 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 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 (<https://sds.studentlife.uiowa.edu/accommodations/apply>).

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.