

Elementary Organic Chemistry (3 Credits)
CHEM 2310, Spring 2025
Monday, Wednesday, and Friday 11:00 to 11:50 AM, 1002 Gilman Hall

Instructor: Prof. Levi Stanley (3101E Hach Hall, Phone: 515-294-3609, e-mail: lstanley@iastate.edu - please include 2310 in the subject of messages)

Office hours: MWF 10-10:50 AM or by appointment.

Communication: Email – I welcome your email with questions about the course. That said, I receive a large amount of email throughout the semester. To ensure your email is answered, please follow these rules: 1) always include “2310” somewhere in the subject line; 2) always send your email from an iastate.edu address; and 3) DO NOT use Canvas to send me emails.

Textbook: *Introduction to Organic Chemistry*, 6th Ed. By Brown and Poon. The textbook is part of the Immediate Access Program at ISU. An accompanying optional *Student Study Guide & Solutions Manual* for is available and recommended, but not required. You are encourage to utilized a molecular model kit to help with 3-dimensional visualizations.

Canvas: Course information including a course syllabus, lectures, previous exams, current exams, supplemental materials, announcements, and grades will be uploaded to Canvas. Please do not use Canvas to contact me. Please use my university email address to contact me.

Homework: We will use the Wiley online homework system in this course (wileyplus.com). WileyPLUS will be integrated into Canvas. You should not need to leave Canvas to complete your homework. Although the online homework is the only graded homework, prior student performance suggests that working end-of-chapter problems from your text greatly improves understanding. **You are strongly encouraged to work as many end-of-chapter problems as possible!**

Grading: The course will be graded out of 600 points. The point breakdown is as follows: 150 points from online homework, 300 points from midterm exams, and 150 points from the final exam. Your final grade may be curved based on the performance of the class, but you are guaranteed the following grades: >86% for an A-, >75% for a B-, >61% for a C-, >50% for a D-.

Exams: There will be four 100-point midterm exams. The exams will be held in person during normal class times as scheduled on the syllabus. **All exams are cumulative.** The best three exam scores from your midterm exams plus the final exam score will be used in the calculation of your final grade. At my discretion, in-class exam scores may be adjusted upward to balance the difficulty of different in-class midterm exams. Cheating on an exam will earn a grade of zero for that exam. Such an exam score cannot be dropped. CHEM 2310 exams from previous semesters are available in Canvas. Exams will be given only on the dates listed in the syllabus. **There will be no make-up exams.**

Re-grade Requests: Grading of exams is not always perfect, and I believe you should receive the grade you earn. Students may request an exam be re-graded within one week after the graded exams are returned. To request an exam re-grade, please write on the front of the exam to describe the nature of your re-grade request.

Course Content: We will cover chapters 1-14 and 16-18 in *Introduction to Organic Chemistry*, 6th Ed., by Brown and Poon. These chapters and the supplemental sections build upon themselves and represent a large amount of material. Thus, it is extremely important that you stay current with your reading and homework assignments. The material will be covered in the order listed in the syllabus. However, the timing may vary based upon student understanding of the material.

Learning Objectives: Elementary Organic Chemistry will be a demanding course. You will be asked to digest a large amount of material in a relatively short time. In addition, you will be asked to master the basic language and fundamental concepts (such as reactivity trends, steric and electronic effects, and basic kinetic and thermodynamic effects) that are the required foundation to solve problems in organic chemistry. The sheer volume of information to be covered is such that rote memorization becomes impractical as a singular learning strategy. Thus, it is critical that you are able to connect to and build upon new and existing knowledge of fundamental principles and concepts in organic chemistry. The most successful students in organic chemistry are often those who understand basic reactivity (nucleophile or electrophile, acid or base) of common functional groups and reagents and are able to apply trends to new problems.

1. You should have a good understanding of molecular structure. This includes sigma and pi bonding, strain, aromaticity, and stereochemistry. You should have a good grasp of three-dimensional structure of molecules and should understand that intermolecular interactions depend on structural relationships.
2. You should be able to recognize the reactive parts of molecules. In particular, you should be able to identify nucleophilic and electrophilic centers. You should understand how to make certain centers more nucleophilic or electrophilic, e.g., by deprotonating or protonating them.
3. You should be able to recognize types of reactions that you see in different contexts. For example, you should recognize substitutions, additions, oxidations, and reductions, no matter whether you see them in organic chemistry or in a biochemistry class.
4. You will have a good fundamental understanding on the chemical reactivity of several common classes functional groups, such as alcohols, carbonyls, and alkenes.
5. You should be able to understand complex reaction mechanisms if they are presented to you. You should be able to suggest reasonable reaction mechanisms for almost every reaction you know, and – based on knowing something about the reactive parts of molecules and reactive intermediates – make a good guess about the mechanism of a new reaction presented to you.
6. You should have a reasonable repertoire of reactions that you can call upon to imagine how to synthesize a molecule of modest complexity or follow its synthesis or biosynthesis as presented to you. In practice, many of you will find this most useful in biological and biochemical contexts.
7. You should be able to apply basic principles of small molecule organic chemistry to useful/common macromolecules like polymers/oligomers, such as carbohydrates, proteins, nucleic acids, and traditional polymers like polystyrene or PVC.

Learning Environment: My goal for this course is to create an active learning environment. To accomplish this goal, you as students must be willing to engage in the learning process. Questions from students, answers to my questions, and participation in problem solving activities are expected.

University Policies

Academic Integrity

The class will follow Iowa State University's policy on academic misconduct (**5.1 in the Student Code of Conduct**). Students are responsible for adhering to university policy and the expectations in the course syllabus and on coursework and exams and for following directions given by faculty, instructors, and ISU Test Center regulations related to coursework, assessments, and exams. Anyone suspected of academic misconduct will be reported to the **Office of Student Conduct in the Dean of Students Office**. Information about academic integrity and the value of completing academic work honestly can be found in the **Iowa State University Academic Integrity Tutorial**.

Accessibility

Iowa State University is committed to advancing equity, access, and inclusion for students with disabilities. Promoting these values entails providing reasonable accommodations where barriers exist to students' full participation in higher education. Students in need of accommodations or who experience accessibility-related barriers to learning should work with Student Accessibility Services (SAS) to identify resources and support available to them. Staff at SAS collaborate with students and campus partners to coordinate accommodations and to further the academic excellence of students with disabilities. Information about SAS is available online at www.sas.dso.iastate.edu, by email at accessibility@iastate.edu, or by phone at 515-294-7220.

Discrimination and Harassment

Iowa State University does not discriminate on the basis of race, color, age, ethnicity, religion, national origin, pregnancy, sexual orientation, gender identity, genetic information, sex, marital status, disability, or status as a U.S. Veteran. Inquiries regarding non-discrimination policies may be directed to Office of Equal Opportunity, 2680 Beardshear Hall, 515 Morrill Road, Ames, Iowa 50011, Tel. 515-294-7612, Hotline 515-294-1222, email eooffice@iastate.edu.

Free Expression

Iowa State University supports and upholds the First Amendment protection of [freedom of speech](#) and the principle of [academic freedom](#) in order to foster a learning environment where open inquiry and the vigorous debate of a diversity of ideas are encouraged. Students will not be penalized for the content or viewpoints of their speech as long as student expression in a class context is germane to the subject matter of the class and conveyed in an appropriate manner.

No employee, student, applicant, or campus visitor is compelled to disclose their pronouns. Anyone may voluntarily disclose their own pronouns.

Mental Health and Well-Being Resources

At Iowa State, we're committed to your success and well-being. As a Cyclone, you can access 24/7 resources, services, and people dedicated to helping you achieve your goals and be your best in and out of the classroom. Whether you need academic support or just someone to talk to, we're here for you at Cyclone Support (cyclonesupport.iastate.edu). If you are struggling emotionally and need support, there's confidential help available 24/7/365. You can call or text 988 or use the chat at 988lifeline.org.

Prep Week

This class follows the Iowa State University Prep Week policy, as noted in the ISU Policy Library and the Senior Vice President and Provost's website.

Religious Accommodations

Iowa State University welcomes diversity of religious beliefs and practices, recognizing the contributions differing experiences and viewpoints can bring to the community. There may be times when an academic requirement conflicts with religious observances and practices. If that happens, students may request the reasonable accommodation for religious practices. In all cases, you must put your request in writing. The instructor will review the situation in an effort to provide a reasonable accommodation when possible to do so without fundamentally altering a course. For students, you should first discuss the conflict and your requested accommodation with your professor at the earliest possible time. You or your instructor may also seek assistance from the [Dean of Students Office](#) at 515-294-1020 or the [Office of Equal Opportunity](#) at 515-294-7612.

Schedule

Date	Chapter	Topic
1/22/25		Course Orientation and Introduction
1/24/25	1	Covalent Bonding and Shapes of Molecules
1/27/25	1	Covalent Bonding and Shapes of Molecules
1/29/25	1	Covalent Bonding and Shapes of Molecules
1/31/25	11	Infrared (IR) Spectroscopy (11.1-11.4)
2/3/25	11	Infrared (IR) Spectroscopy (11.1-11.4)
2/5/25	2	Acids and Bases
2/7/25	2	Acids and Bases
2/10/25	3	Alkanes and Cycloalkanes
2/12/25	3	Alkanes and Cycloalkanes
2/14/25	4	Alkenes and Alkynes
2/17/25	4	Alkenes and Alkynes
2/19/25	1-4, 11	Review
2/21/25		Exam 1 (Chapters 1-4, 11)
2/24/25	5	Reactions of Alkenes and Alkynes
2/26/25	5	Reactions of Alkenes and Alkynes
2/28/25	5	Reactions of Alkenes and Alkynes
3/3/25	6	Chirality: The Handedness of Molecules
3/5/25	6	Chirality: The Handedness of Molecules
3/7/25	7	Haloalkanes
3/10/25	7	Haloalkanes
3/12/25	5-7	Review
3/14/25		Exam 2 (Chapters 5-7)
3/17/25-3/21/25		No Class – Spring Break
3/24/25	8	Alcohols, Ethers, and Thiols
3/26/25	8	Alcohols, Ethers, and Thiols
3/28/25	9	Benzene and Its Derivatives
3/31/25	9	Benzene and Its Derivatives
4/2/25	10	Amines
4/4/25	8-10	Review
4/7/25		Exam 3 (Chapters 8-10)
4/9/25	11	Nuclear Magnetic Resonance (NMR) Spectroscopy (11.5-11.2)
4/11/25	11	Nuclear Magnetic Resonance (NMR) Spectroscopy (11.5-11.2)
4/14/25	12	Aldehydes and Ketones
4/16/25	12	Aldehydes and Ketones
4/18/25	13	Carboxylic Acids
4/21/25	14	Functional Derivatives of Carboxylic Acids
4/23/25	14	Functional Derivatives of Carboxylic Acids
4/25/25	11-14	Review
4/28/25		Exam 4 (Chapters 11-14)
4/30/25	16	Organic Polymer Chemistry
5/2/25	17	Carbohydrates
5/5/25	18	Amino Acids and Proteins
5/7/25	1-18	Review
5/9/25	1-18	Review
5/12/25-5/15/25		Final Exam Time To Be Determined

THE FINAL EXAM TIME IS TO BE DETERMINED. DO NOT SCHEDULE VACATION TRAVEL UNTIL AFTER YOUR SCHEDULED EXAM.