

Day and time:	Tuesdays and Thursdays 10:00 – 10:50 am
Room:	1104 Gilman
Instructor:	Prof. Junqi Li
Office:	3128 Hach Hall
Phone:	515-294-7268
Email:	junqili@iastate.edu [Write "CHEM 531" in the beginning of the subject line]
Office hours:	By appointment

Textbook: This course will not follow any textbook closely. For supplementary reading, you may consider *March's Advanced Organic Chemistry* by Michael B. Smith and Jerry March, *Advanced Organic Chemistry Part B: Reactions and Synthesis* by Francis A. Carey and Richard J. Sundberg, and *Heterocyclic Chemistry* by John A. Joule and Keith Mills.

Electronic resource: Encyclopedia of Reagents for Organic Synthesis (open access online).

Canvas: Lecture notes, problem sets, grades, and class announcements will be posted on Canvas.

Grading and exams:

5 problem sets, 50 points each	250 points
1 Mid-term exam	100 points (Week of Mar 8)
1 Final exam	150 points
Total	500 points

All exams are cumulative and open-note. Lecture notes and handwritten notes are allowed during the exam, but not textbooks or electronic material.

Learning Objectives: The purpose of this course is to be a resource for students conducting organic synthesis, and to provide a foundation for understanding modern literature in organic synthesis. Do not use Scifinder or other reaction databases (e.g. Reaxys) to complete problem sets. The purpose of the course is NOT to have you do blind searches.

Course Expectations: You will be expected to participate in class discussions and contribute to your own learning experience. All problem sets must be completed on time.

COVID-19 health and safety requirements: Students are responsible for abiding by the university's COVID-19 health and safety expectations. All students attending this class in-person are required to follow university policy regarding health, safety, and face coverings:

- Wear a cloth face covering in all university classrooms, laboratories, studios, and other in-person instructional settings and learning spaces. Cloth face coverings are additionally required to be worn indoors in all university buildings, and outdoors when other people are or may be present where physical distancing of at least 6 feet from others is not possible. Students with a

documented health or medical condition that prevents them from wearing a cloth face covering should consult with Student Accessibility Services in the Dean of Students Office.

- Ensure that the cloth face covering completely covers the nose and mouth and fits snugly against the side of the face.
- Practice physical distancing to the extent possible.
- Assist in maintaining a clean and sanitary environment.
- Not attend class if you are sick or experiencing symptoms of COVID-19.
- Not attend class if you have been told to self-isolate or quarantine by a health official.
- Follow the instructor's guidance with respect to these requirements. Failure to comply constitutes disruptive classroom conduct. Faculty and teaching assistants have the authority to deny a non-compliant student entry into a classroom, laboratory, studio, conference room, office, or other learning space.

These requirements extend outside of scheduled class time, including coursework in laboratories, studios, and other learning spaces, and to field trips. These requirements may be revised by the university at any time during the semester.

Academic Dishonesty: Academic Misconduct in any form is in violation of Iowa State University Student Disciplinary Regulations and will not be tolerated. This includes, but is not limited to: copying or sharing answers on tests or assignments, plagiarism, using Scifinder and other reaction databases to complete problem sets, and having someone else do your academic work. Depending on the act, a student could receive an F grade on the test/assignment, F grade for the course, and could be suspended or expelled from the University. See the Conduct Code at www.dso.iastate.edu/ja for more details and a full explanation of the Academic Misconduct policies.

Accessibility Statement: Iowa State University is committed to assuring that all educational activities are free from discrimination and harassment based on disability status. Students requesting accommodations for a documented disability are required to work directly with staff in Student Accessibility Services (SAS) to establish eligibility and learn about related processes before accommodations will be identified. After eligibility is established, SAS staff will create and issue a Notification Letter for each course listing approved reasonable accommodations. This document will be made available to the student and instructor either electronically or in hard-copy every semester. Students and instructors are encouraged to review contents of the Notification Letters as early in the semester as possible to identify a specific, timely plan to deliver/receive the indicated accommodations. Reasonable accommodations are not retroactive in nature and are not intended to be an unfair advantage. Additional information or assistance is available online at www.sas.dso.iastate.edu, by contacting SAS staff by email at accessibility@iastate.edu, or by calling 515-294-7220. Student Accessibility Services is a unit in the Dean of Students Office located at 1076 Student Services Building.

Dead Week: This class follows the Iowa State University Dead Week policy as noted in <https://www.provost.iastate.edu/academic-programs/dead-week>

Harassment and Discrimination: Iowa State University strives to maintain our campus as a place of work and study for faculty, staff, and students that is free of all forms of prohibited discrimination and harassment based upon race, ethnicity, sex (including sexual assault), pregnancy, color, religion, national origin, physical or mental disability, age, marital status, sexual orientation, gender identity, genetic information, or status as a U.S. veteran. Any student who has concerns about such behavior should contact his/her instructor, Student Assistance at 515-294-1020 or email dso-sas@iastate.edu, or the Office of Equal Opportunity and Compliance at 515-294-7612.

Religious Accommodation: If an academic or work requirement conflicts with your religious practices and/or observances, you may request reasonable accommodations. Your request must be in writing, and your instructor or supervisor will review the request. You or your instructor may also seek assistance from the Dean of Students Office or the Office of Equal Opportunity and Compliance.

Freedom of Speech and Academic Freedom: 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.

Contact Information: If you are experiencing, or have experienced, a problem with any of the above issues, email academicissues@iastate.edu.

Dead Week: This class follows the Iowa State University Dead Week policy as noted in section 10.6.4 of the Faculty Handbook (<http://www.provost.iastate.edu/resources/faculty-handbook>)

Tentative schedule for Spring 2021 CHEM 531

Week	Date	Key Topics
1	Week of Jan 25	Course details, introduction, activation of OH and COOH
2	Week of Feb 1	Protecting groups
3	Week of Feb 8	Oxidation Oxidation
4	Week of Feb 15	Reduction Reduction
5	Week of Feb 22	Enolate chemistry: thermodynamic mode (catalytic procedures) Enolate chemistry: kinetic mode (stoichiometric procedures)
6	Week of Mar 1	Michael addition and annulation
7	Week of Mar 8	Alkene formation – carbonyl olefination and metathesis Polar additions to alkenes and alkene synthesis via elimination Mid-term exam
8	Week of Mar 15	Organolithium and organomagnesium chemistry Organozinc and organocopper chemistry
9	Week of Mar 22	Organoboron chemistry Organosilicon chemistry
10	Week of Mar 29	Alkynes
11	Week of Apr 5	Arene chemistry C-C forming cross-coupling reactions
12	Week of Apr 12	C-X forming cross-coupling reactions Heterocycles – pyridines, pyryliums, quinolines
13	Week of Apr 19	Heterocycles – pyrroles and furans Heterocycles – indoles and benzofurans
14	Week of Apr 26	Review
15	Week of May 3	Final exam