

Chemistry 333L Course Syllabus

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Instructor Office Hours	M, W 2-3 pm or by appointment

CHEM 331 and 333L are co-requisite courses, i.e., students in CHEM 333L are required to take CHEM 331 at the same time or to have already received credit in CHEM 331. Co-requisite course requirements are strictly enforced: Students who do not meet the co-requisite should drop the course or **they will receive an F in the course.** Students who drop or audit CHEM 331 will be required to drop CHEM 333L. To add lab sections during the first week of class, use AccessPlus. After the first week, please go to the Undergraduate Chemistry Office in 1608 Gilman.

Learning Objectives

At the end of this course, you will be able to

Understand and follow current lawful and safe chemical handling practices (e.g., personal protective devices) and the hazards associated with the use of common organic reagents.

Carry out and understand many common organic chemistry tasks, including percent yield calculations, thin layer chromatography, recrystallization, distillation, extractions, solvent removal, and temperature control of reactions (reflux, ice-baths, etc.).

Carry out key organic syntheses along with purifying and characterizing obtained product.

Understand the mechanism for each synthesis performed as well as underlying fundamental patterns.

Required Personal Protective Equipment (PPE)

Safety Eyewear: UVEX — Model S040C Safety Glasses or Jones & Co. Visorgogs or Magid Glove and Safety Manufacturing “Sapphire” safety glasses. Safety eyewear may be purchased at the bookstore and chemstores. Other styles or types of protective eyewear require approval from the course instructor. ***Safety eyewear is required in the laboratory at all times.***

Lab coat: A mid-thigh length or longer lab coat must be purchased. These are available at the bookstore, chemstores, Amazon, etc. Avoid synthetic lab wear since synthetics melt if exposed to fire.

Additional PPE: gloves (provided), and closed-toe, closed-heel shoes are important components for lab safety.

PPE is required in the laboratory at all times.

Course Materials

You will be using digital Signals Lab Notebook provided by the chemistry department. Your TA will show you how to use this during the first prelab discussion. You will not need to submit lab reports on Canvas since your TA will grade your lab reports within Signals.

All required lab readings and supplemental information are posted on Canvas.

Assessments

Safety

- Signed Safety Contract (5 pts)
 - Read the safety contract available via link on the 333L Intro page. Download and sign using the draw tool in Microsoft Word. Submit using the provided link on the 333L Intro page.
- EHS Safety Courses (5 pts ea)

- Click Links on the 333L Intro page to access. Watch the presentation and take the associated quiz. You need 80% on the quiz for the training to be marked as complete.

Lab Reports (40 pts ea)

- For each experiment, you will create an experiment in your Signals Lab Notebook using templates as instructed. Each experiment will have Pre-lab, In-lab, Data and Analysis, and sometimes Evaluation sections. Your TA will give details on your first day of class.

Projects

- Technique Project
 - Proposal (40 pts)
 - Report (40 pts)
- Synthesis Project
 - Proposal (40 pts)
 - Report (40 pts)

Detailed information for the projects can be found on Canvas in the corresponding modules.

Drops

At the end of the semester two Lab Report scores will be dropped. These drops are provided to account for such things for conflicting evening exams, required performances, class trips, extracurricular activity conflicts, and illness. If you miss two lab classes due to required academic events (e.g. evening exam) or a documented health/family issue, and find you have an additional conflict with your lab class, email your course instructor as soon as possible and before missing a third lab to discuss alternatives.

Projects, and the required lab check-out will not be dropped. If you have a conflict due to an academically required event or documented health/ family issue, email your course instructor as soon as humanly possible to discuss alternatives.

Missed Experiments

There are generally **NO MAKE-UP experiments**. See above for information about drops.

The remaining scores after your two drops will be used to calculate the final grade.

Grading

Grading scale for final grades: A > 93%, A- > 90%, B+ > 87%, B > 83%, B- > 80%, C+ > 77%, C > 73%, C- > 70%, D+ > 67%, D > 63%, and D- > 60%, and F < 60%.

Important Course Policies:

1. **It is the student's responsibility to make sure that Lab Reports and Project Proposals and Reports are completed on time. In case of technical problems, please email your TA IMMEDIATELY. This should be either before or very shortly after the deadline. Do not wait until the deadline has long passed otherwise your work will not be graded.**
2. It is the student's responsibility to check grades on Canvas on a weekly basis.
3. **Any complaint on a grade MUST be brought up within 1 week of receiving the returned graded work to have the grade corrected. No exceptions.**
4. Use of personal electronic devices of any type (e.g., laptops and cell phones) is strongly discouraged in the lab. If you choose to use your own personal device in the lab, you do so at your own risk since it is a lab environment.
5. Presence at Lab Check-out is mandatory. Lab Check-out must be done on the scheduled day at the scheduled time. **Failure to check-out will result in 0 points on your last submitted and graded Analysis Questions.**

Academic Misconduct

Academic Misconduct in any form is in violation of ISU *Student Disciplinary Regulations* and will not be tolerated. This includes, but is not limited to: copying answers on lab reports, plagiarism (This refers to copying anyone else's work and claiming as your own. A common example is copying information from a website without giving a reference), submitting a lab report for an experiment not

performed, or 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 <http://www.dso.iastate.edu/ja> for more details and a full explanation of the ISU Academic Misconduct policies. In any case, the student will be reported to the Dean of the Students Office.

Accessibility and Mental Health Support

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.

Student Counseling Services (SCS) provides confidential prevention, intervention, information, and referral services to Iowa State students. Assistance is available for students coping with relationship problems, low self-esteem, stress, loneliness, depression, cultural differences, sexual assault recovery, childhood abuse, trauma, eating disorders, substance abuse, career/major concerns, academic motivations, and other concerns. Students can initiate services at SCS during the walk-in hours (see SCS website) or during business hours if crisis counseling is needed. Check out their website for additional information: <https://counseling.iastate.edu/>.

*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.*

Schedule

Day	Date	Experiment
1	8/21/23	Intro to 333L
2	8/23/23	TLC and Chem Draw
3	8/28/23	Recrystallization
4	8/30/23	Distillation and IR
5	9/4/23	Holiday
6	9/6/23	NMR
7	9/11/23	mNova
8	9/13/23	Extraction
9	9/18/23	Column Chromatography (Azulene & Imine)
10	9/20/23	Column Chromatography
11	9/25/23	Intro to Synthesis (Substitution)
12	9/27/23	Primary vs Secondary Substrate
13	10/2/23	Technique Project Workshop
14	10/4/23	Technique Project (proposal due 9/26)
15	10/9/23	Technique Project
16	10/11/23	Ester by SN2
17	10/16/23	Acid-Catalyzed Dehydration of 3,3-Dimethyl-2-butanol
18	10/18/23	SN1: Reaction of 3,3-dimethyl-2-butanol with HBr

19	10/23/23	SciFinder Workshop
20	10/25/23	Dehydration of 2,3-Dimethyl-2,3-butanediol
21	10/30/23	NMR Coupling Constants
22	11/1/23	NaBH ₄ reduction of Butylcyclohexanone
23	11/6/23	Reaction of Dichlorocarbene with Cyclohexene
24	11/8/23	Bromination of Cinnamic Acid
25	11/13/23	Indene Bromohydrin Synthesis
26	11/15/23	Epoxidation Chalcone
27	11/20/23	Thanksgiving Break
28	11/22/23	Thanksgiving Break
29	11/27/23	Synthesis Project (Proposal due 11/12)
30	11/29/23	Synthesis Project
31	12/4/23	check-out