

Chemistry 334L Course Syllabus

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Chem 332 and 334L are co-requisite courses, i.e., students in Chem 334L are required to take Chem 332 at the same time or to have already received credit in 332. 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 332 will be required to drop 334L. To add classes during the first week of class, use AccessPlus. After the first week, please use the digital schedule change form also available on AccessPlus.

Learning Objectives

The main goal of the 333L-334L sequence is to prepare you for research in a synthetic organic research lab. As such, you will learn and perform a wide variety of useful techniques and syntheses. You will be expected to interpret and describe your results in a professional manner.

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. Other styles or types of protective eyewear require approval from the department safety officer or course instructor. **Safety eyewear is required in the laboratory at all times.**

Lab coat: A knee length or longer lab coat must be purchased. These are available at the bookstore.

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 were provided a hardbound laboratory notebook in 333L. Additional notebooks are available on request. Pre-lab notes as well as In-lab notes are required for each experiment as in CHEM 333L

All required lab readings, powerpoints, and tutorials are posted on Canvas. Submission links for your lab reports are also on Canvas. Modules are arranged by day in order to make everything easy to find.

Assessments

Pre-lab Quizzes

Pre-lab Quizzes are available on Canvas. These are not counted toward your final grade, but are provided for practice.. They cover topics ranging from background, safety, general and organic chemistry concepts from your experiment readings, tutorial info, or topics you should already have learned, all of which are important for understanding the experiment.

Laboratory Notebook

Pre-lab notes as well as In-lab notes submissions are required for each experiment.

Analysis Questions

After completing the experiment, the goals are for you to carefully analyze what you did, how what you did ties into what you have done previously and what you are learning in lecture, and what your data means. In order to assess the accomplishment of these goals, you must submit Analysis Questions after each experiment.

Project

You will have a final project at the end of the semester. There is no final exam for this course.

Drops

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

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

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

Grading

Grading scale for final grades: A \geq 93%, A- \geq 90%, B+ \geq 87%, B \geq 83%, B- \geq 80%, C+ \geq 77%, C \geq 73%, C- \geq 70%, D+ \geq 67%, D \geq 63%, and D- \geq 60%, and F < 60%. Grades are round up at the end of the semester. (e.g. 92.5% = A)

Missed Experiments

There are NO MAKE-UP experiments. In addition, **you MUST attend your assigned lab section unless you have permission otherwise.** You cannot submit LabNotes or Analysis Questions for experiments you did not perform unless you have permission. **If you need to miss lab due to serious issue beyond your control, email your course instructor and TA asap to discuss alternatives.**

Important Course Policies

1. **It is the student's responsibility to make sure that submissions are properly uploaded/submitted by the deadline. In case of technical problems, please email your TA or Instructor IMMEDIATELY.** Do not wait until the next day.
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 graded work to have the grade corrected.**
4. Use of personal electronic devices of any type (e.g., laptops) is strongly discouraged in the lab. If you choose to use your own personal device, you do so at your own risk since it is a lab environment. Music streaming is not allowed without permission since doing so is distracting to some students.
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 an undropped Analysis Question submission unless you have permission to be absent due to a serious issue beyond your control.**

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/>.

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: plagiarism (copying someone else's work and submitting as your own), submissions 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 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.

Freedom of Speech

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.

S22 334L

Experiment

Schedule

Date	Week	Day	Experiment
18-Jan	1	1	Intro and Review
23-Jan	1	2	Fluorene to Fluorenol: oxidation
25-Jan	2	3	Fluorene to Fluorenol: column
30-Jan	2	4	Fluorene to Fluorenol: reduction and Review NMR technique
1-Feb	3	5	EAS: Nitration
6-Feb	3	6	Coupling Constants Review and/or C13 NMR, EAS: Nitration (finish)
8-Feb	4	7	Friedel-Crafts Synthesis
13-Feb	4	8	Friedel-Crafts Synthesis
15-Feb	5	9	Friedel-Crafts Synthesis
20-Feb	5	10	Friedel-Crafts Synthesis
22-Feb	6	11	Grignard
27-Feb	6	12	Grignard
1-Mar	7	13	Wittig
6-Mar	7	14	Acetylation of Vanillin or Suzuki
8-Mar	8	15	Finish Acetylation of Vanillin or Suzuki
13-Mar	8	16	Spring Break
15-Mar	9	17	Spring Break
20-Mar	9	18	Imine Synthesis and Reduction
22-Mar	10	19	Finish Imine Reduction, if needed.
27-Mar	10	20	Aldol and Michael
29-Mar	11	21	Aldol and Michael
3-Apr	11	22	Diels Alder
5-Apr	12	23	Workshop Day for Project
10-Apr	12	24	Multistep Synthesis Project
12-Apr	13	25	Multistep Synthesis Project
17-Apr	13	26	Multistep Synthesis Project
19-Apr	14	27	Multistep Synthesis Project
24-Apr	14	28	Multistep Synthesis Project
26-Apr	15	29	Multistep Synthesis Project
1-May	15	30	check-out
27-Apr	15	27	Multistep Synthesis Project
2-May	15	28	check-out