

CHEM 3381 Organic Majors Lab Syllabus, Fall 2023

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Welcome back to the organic chemistry labs at CU! This new version of CHEM 3381 is a continuation of the nonmajors organic 1 lab (CHEM 3321) and nonmajors organic 2 lab (CHEM 3341). Techniques learned in 3321/3341 are expanded upon in more detail, and new techniques are covered including new methods of characterization, microwave chemistry, large-scale column chromatography, and literature searches. Many new reactions are performed, including Grubbs metathesis and palladium coupling.

The capstone project for this course is a four-week independent synthesis project chosen by the students, following a procedure from literature. You will write a paper about your synthesis and present your work to the class.

List of Sections

Section	Day	Time	Location	TA	TA Email
401	Tue/Thu	10:10 AM-1:00 PM	EKLC M1B35	Austin Bargmann	Austin.Bargmann@colorado.edu

Experiment Schedule

Dates	#	Experiment
Tue Aug 23		No labs
Thu Aug 25		Syllabus & NMR review (remote)
Tue Aug 30	14	Check-In & Epoxidation of Cholesterol
Thu Sep 1	27	Advanced Spectroscopy
Tue Sep 6	28	Chemical Literature
Thu Sep 8	29	Computational Chemistry
Tue Sep 13	15	Diels-Alder Reaction
Thu Sep 15	16	Electrophilic Aromatic Substitution
Tue Sep 20	17	Microscale Column Chromatography
Thu Sep 22	18	Identification of Unknowns day 1
Tue Sep 27	18	Identification of Unknowns day 2
Thu Sep 29	31	Large-Scale Column Chromatography (Setup for Grubbs)
Tue Oct 4	36	Grubbs Metathesis (Start choosing project)
Thu Oct 6	19	Reduction of Ketones (ID of Unknowns paper due)
Tue Oct 11	20	Wittig Reaction (Project proposal & materials request due)
Thu Oct 13	21	Grignard Dyes
Tue Oct 18	22	Liquid Crystals (Setup for Frambinone)
Thu Oct 20	23	Fischer Esterification
Tue Oct 25	41	Synthesis of Frambinone day 1
Thu Oct 27	41	Synthesis of Frambinone day 2
Tue Nov 1	42	Multistep Synthesis Project, day 1
Thu Nov 3	42	Multistep Synthesis Project, day 2
Tue Nov 8	42	Multistep Synthesis Project, day 3

Thu Nov 10	42	Multistep Synthesis Project, day 4
Tue Nov 15	42	Multistep Synthesis Project, day 5
Thu Nov 17	42	Multistep Synthesis Project, day 6
Tue Nov 22		No labs
Thu Nov 24		No labs
Tue Nov 29	42	Multistep Synthesis Presentations
Thu Dec 1	42	Multistep Synthesis Presentations, Final Quiz & Check-Out
Tue Dec 6		No labs
Thu Dec 8		No labs

Grading

Canvas: This course will use Canvas, which can be accessed at canvas.colorado.edu. All assignments must be submitted through Canvas; assignments submitted via email or paper copy will not be accepted unless you have prior permission. Grades will be posted in Canvas, as well as a complete list of assignments and the points value for each. You can check the grades of individual items against your own records to make sure they're correct, but your course total might not reflect any excused absences or curves.

Your due dates for assignments will be set based on your lab section, and most assignments are due at either the start or the end of your scheduled lab period. If you switch sections at any point, Canvas might not update your due dates properly. In this case, you are responsible for contacting OIThelp@colorado.edu, letting them know which section you have recently swapped into, and asking them to update your due dates in Canvas. Any late penalties you incur due to incorrect due dates will not be removed except in extenuating circumstances.

Quizzes: Quizzes cover assigned reading, procedures, and Experiment Manual study questions. They are due on Canvas at the starting time for your lab, but you can complete them at any point before then. The study questions from the Experiment Manual are designed to help you prepare for the quizzes, and they have answers posted on the course website. You don't need to turn in the answers to study questions in your lab reports but they are helpful for studying.

Regrades: If you notice a missing or erroneous grade on a quiz or lab, you must bring it to your TA's attention within two lab periods of the work being graded. After this point, no regrades will be accepted.

Late work: If you turn in any item late, you will lose 10% of the maximum possible points per day or partial day. For instance, a 20-point assignment will have 2 points deducted for each day that it is late. In order to submit final grades on time, no late work will be accepted after the final quiz is due for the course.

Curving: At the end of the semester, if the average grade for your lab section (excluding the students who have at least one zero grade) is below 85%, the average will be curved up to 85%. There is no guaranteed number of A grades, B grades, etc. per section. Your final letter grade will be based on the following standard scale: 93% and up is an A, 90-92.99% is an A-, 87-89.99% is a B+, etc. Grades near a cutoff will not be bumped up except in extenuating circumstances, at the discretion of the Lab Director.

Absences: You may take an excused absence for up to 1 experiment during the semester. In this case, the entire experiment will be dropped from your grade, and your grade will be out of fewer points. Note that you

must request this option from your TA. Your lowest lab grade will not automatically be dropped, and you cannot drop an experiment if you've already submitted the lab report.

In addition, you may choose to perform up to 1 additional experiment remotely. This will involve watching a 10–15-minute video of a TA performing the lab, then writing up a lab report based on the TA's data. If your class needs to be held remotely for any part of the semester, this will not count against your limit of 1 remote experiment. However, you must attend in-person for the final quiz and lab checkout.

If you miss more than 2 experiments, you must either drop the class or take an incomplete – contact the Lab Director for details.

Help Room: Feel free to visit the OChem help room whenever it's staffed. A schedule will be posted at <http://www.orgchemboulder.com/About>, with the times that TAs are available to help you.

Cleanup Points: In the organic chemistry teaching labs you are expected to take care of the equipment and lab space that you use. Each lab period that involves a wet lab (using chemicals, not just model kits or paperwork) has 5 cleanup points associated with it, and lab checkout has 10 cleanup points associated with it. Those points are awarded to the whole class as a group. If the lab is left in disarray after your lab section, you and everyone else in your section will lose points for each violation of the cleanup requirements. These requirements are linked from the front page of this course's Canvas page. Each section's cleanup points will be posted here on a regular basis. Although it is not required, you can greatly increase your chance of getting full points by assigning cleanup to two or three students per class meeting. A sheet will be passed around during the first week to help you organize this.

Course Policies

Lab Safety Rules: You are required to follow the lab safety rules at all times or risk being expelled from the lab for the day and taking an unexcused absence. These rules are given in Chapter 1 of the Lab Handbook; and will be explained by your TA.

Lab Drawers: You are accountable for the contents of your lab drawer throughout the semester. Further information is given on the lab drawer check-in sheet you will use during the first lab session.

Pregnancy and Chemical Exposure Notice: Pregnant students should be aware that there are risks associated with the development of the embryo and fetus from exposure to certain chemicals. Likewise, students with certain medical conditions could also experience an adverse effect from exposure to chemicals. The Department of Chemistry recommends that you discuss the Organic Chemistry chemical list, procedures, and required safety precautions with your physician. The Department of Chemistry will work with you to discuss possible options regarding meeting the requirements of the course. Please contact the instructor of your course to discuss these options and any questions you may have.

Required Texts and Supplies:

- Approved safety goggles and lab coat
- Organic chemistry model set

To make them more affordable, the lab manual and handbook will be available as PDFs in Canvas, so you won't need to purchase them. Also, since all lab reports will be turned in as PDFs in Canvas, you do not need to record your experimental observations in a carbon-copy lab notebook; any notebook will work.

Organic modeling kits from various different manufacturers are available for lower cost online, but whichever kit you purchase, you should make sure it has at least 10–15 carbon atoms (they are usually the

ones made of black plastic).

Prerequisites and Corequisites: Students enrolled in CHEM 3381 must have passed both Organic Chemistry 2 lab and lecture (either majors or nonmajors), with a grade of C– or better in both courses. Failure to meet this requirement will result in being administratively dropped from the course. Exceptions will be determined by the Lab Director.

Add/Drop: Students who do not attend the first laboratory session may be automatically dropped from the lab or the lecture to make room for people on the wait list. It is your responsibility to know your schedule and to make changes accordingly. Information regarding drop/add deadlines can be found on the [registrar's website](#).

Email Policy: Announcements from your TA or Lab Director will occasionally be sent to your official CU email address, via the roster emailing system, or through Canvas announcements. It is your responsibility to check your CU email account and Canvas frequently. You may set up email forwarding from your CU account to another email address if you prefer, but you do so at your own risk. If you suspect your email account is not working properly, you must contact CU's tech support at help@colorado.edu and make sure it is in order. Missed email will not be considered a valid excuse for missing or incorrect assignments. See the [Student Email Policy](#) for more details.

Classroom Behavior: Both students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote or online. Failure to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. For more information, see the [classroom behavior](#) policy, the [Student Code of Conduct](#), and the [Office of Institutional Equity and Compliance](#).

Requirements for Infectious Diseases: Members of the CU Boulder community and visitors to campus must follow university, department, and building health and safety requirements and all public health orders to reduce the risk of spreading infectious diseases.

The CU Boulder campus is currently mask optional. However, if masks are again required in classrooms, students who fail to adhere to masking requirements will be asked to leave class. Students who do not leave class when asked or who refuse to comply with these requirements will be referred to Student Conduct & Conflict Resolution. Students who require accommodation because a disability prevents them from fulfilling safety measures related to infectious disease will be asked to follow the steps in the “Accommodation for Disabilities” statement on this syllabus.

For those who feel ill and think you might have COVID-19 or if you have tested positive for COVID-19, please stay home and follow the further guidance of the Public Health Office. For those who have been in close contact with someone who has COVID-19 but do not have any symptoms and have not tested positive for COVID-19, you do not need to stay home.

Accommodation for Disabilities, Temporary Medical Conditions, and Medical Isolation: Disability Services determines accommodations based on documented disabilities in the academic environment. If you qualify for accommodations because of a disability, submit your accommodation letter from Disability Services to your faculty member in a timely manner so your needs can be addressed. Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance.

If you have a temporary medical condition or required medical isolation for which you require accommodation, please contact the lab director as soon as possible so your needs can be addressed. Also see [Temporary Medical Conditions](#) on the Disability Services website.

Preferred Student Names and Pronouns: CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors' class rosters. In the absence of such updates, the name that appears on the class roster is the student's legal name.

Honor Code: All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the [Honor Code](#). Violations of the Honor Code may include but are not limited to: plagiarism (including use of paper writing services or technology such as essay bots), cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty. All incidents of academic misconduct will be reported to Student Conduct & Conflict Resolution (honor@colorado.edu; 303-492-5550). Students found responsible for violating the Honor Code will be assigned resolution outcomes from the Student Conduct & Conflict Resolution as well as be subject to academic sanctions from the faculty member. Visit [Honor Code](#) for more information on the academic integrity policy.

Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation: CU Boulder is committed to fostering an inclusive and welcoming learning, working, and living environment. University policy prohibits [protected-class](#) discrimination and harassment, sexual misconduct (harassment, exploitation, and assault), intimate partner violence (dating or domestic violence), stalking, and related retaliation by or against members of our community on- and off-campus. These behaviors harm individuals and our community. The Office of Institutional Equity and Compliance (OIEC) addresses these concerns, and individuals who believe they have been subjected to misconduct can contact OIEC at 303-492-2127 or email cureport@colorado.edu. Information about university policies, [reporting options](#), and support resources can be found on the [OIEC website](#).

Please know that faculty and graduate instructors have a responsibility to inform OIEC when they are made aware of any issues related to these policies regardless of when or where something occurred. This is to ensure that individuals impacted receive an outreach from OIEC about their options for addressing a concern and the support resources available. To learn more about reporting and support resources for a variety of issues, visit [Don't Ignore It](#).

Religious Holidays: Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, absences for religious reasons will be handled the same way as any other excused absence. See the [campus policy regarding religious observances](#) for full details.

Mental Health and Wellness: The University of Colorado Boulder is committed to the well-being of all students. If you are struggling with personal stressors, mental health or substance use concerns that are impacting academic or daily life, please contact [Counseling and Psychiatric Services \(CAPS\)](#) located in C4C or call (303) 492-2277, 24/7. Free and unlimited telehealth is also available through [Academic Live Care](#). The Academic Live Care site also provides information about additional wellness services on campus that are available to students.