

Instructor: Ogar Ichire (PhD)

Lab meets 12-3:30pm

TA:

Office: Olin 205 A

Lab: Olin 232

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Office hours: Open door (via zoom)

Required Materials:

Text: Laboratory Techniques in Organic Chemistry, Fourth Edition

Mohrig, et. al., W.H. Freeman and Co., © 2014, ISBN 978-1-4641-3422-7 (Techniques - **required**)

CATALYST Organic Chemistry Lab, CHEM 2461, 2462, 2463 by J. Hornback (some labs – not required)

Students will be **required** to wear safety ***goggles, nose mask*** and ***lab coat*** during lab.

A laboratory notebook (see lab notebook requirements)

Canvas Access (labs and postlabs will be posted to Canvas)

Additional References available: <https://www.organicdivision.org/links/>

Course Philosophy:

This course is designed with the educational goals and mission of the University of Denver and the Chemistry Department in mind. The chemistry department's mission is to develop confident, well-prepared students who can contribute to the society on issues relating to modern chemistry and scientific discovery. Students are expected to develop strong oral and written communication skills, to engage in critical thinking, to develop excellent laboratory skills, to work on independent research projects, and to prepare for careers in industry, academia, and other professional areas.

In keeping with this mission this course aims to develop the following skills:

1. Know and use standard laboratory techniques.
2. Know and use basic analytic tools, techniques, and instrumentations.
3. Use and critically analyze chemical literature.
4. Communicate scientific issues in writing.
5. Apply current chemical theory/content to solving problems.
6. Investigate some applications of organic chemistry.

In particular, Organic Chemistry Lab will meet these goals by:

1. Reinforcing the common laboratory techniques and procedures used in organic chemistry I and analytical techniques introduced in organic chemistry II.
2. We will use the chemistry reference materials to identify chemical properties and hazards associated with each chemical that we use and make in the laboratory. Part of each pre-lab assignment is to gather this information into a table format in your lab notebook.
3. Being able to effectively communicate an understanding of chemical theory in writing is essential to all practicing scientist. The only way to establish these skills is through practice. Therefore, each lab will include a post-lab or lab report assignment which will ask you to effectively communicate your lab results, the interpretation of these results, and explanation of results to relevant chemical theories.

Organic Chemistry III Laboratory

For organic chemistry III, we will work on some named reactions and applied labs. But first, we will learn how to use a common database called SciFinder-n to obtain primary literature references and to do searches. Typically, a good literature search is a natural first step performed by chemist before heading to the lab to run any reaction. ScFinder, now SciFinderⁿ, is the key database used by organic chemists for this task and for planning before carrying out reactions in the lab. The lab activity on Scifinder will show you how to search for known compounds, reaction procedures, vendors, analytical data, and even research a scientific topic of interest.

Parts of a Lab Assessment

Pre-lab assignments:

Each lab will have a pre-lab or before-you-begin (BYB) assignment to be completed in your laboratory notebook before the start of lab. Note that each prelab will have a reading portion that introduces you to the lab topic. It is expected that you complete this reading before coming to lab. Also, **the labs will be standalone** – that is, the lab topics/project might not have been covered in lecture, but the materials (the techniques book, lab procedure and SciFinder search) given to you are sufficient for the lab. We expect you to read the research papers, the lab procedures, the techniques book, and do the lab and answer the post lab questions that follow. A one or two-page summary of the assigned reading will be worth 10 points of your prelab - take the reading seriously.

Doing the Lab and Lab Performance:

You are expected to show up to lab and do each experiment. **There will be no makeup labs.** This part of your grade will be for actual doing the lab and how prepared you are for it. 20 points will be for showing up and doing the lab and another 20 points for preparedness. To earn all 20 points for lab performance you should be prepared for the lab, pay attention to lab techniques, safety, cleanliness, and complete the lab in a timely fashion. You will lose points if you do not have a lab procedure ready, use your cell phone in lab, spill chemicals, leave drawers unlocked, behave inappropriately, use equipment incorrectly, touch door knobs with gloves on, or leave your glassware outside your drawer at the end of lab. All shared glassware must be washed and returned to the designated location.

Post-lab assignments (Reports):

Each lab will have a post-lab assignment or report due at the **beginning of lab** or on Canvas according to the schedule. Post-labs should be typed unless noted. Late post-labs or reports will lose points according to the following guidelines: 1 day late minus five points, 2 days late minus 10 and so on. A week late from the due date would be minus 30 points.

Course Grading:

Your score in the course will be determined using a point system shown below:

<i>Areas evaluated:</i>	<i>Frequency × Points</i>	<i>Total Points in Area</i>	<i>Approximate Percentage of Grade</i>
Pre-lab (Reading summary is worth 10 pts)	6 × 20	120	13.3 %
Doing the Lab and Lab performance	6 × 40	240	26.6 %
Post-lab or Reports	6 × 60	360	39.9 %
Lad Design_Crystal_Lab	80	80	8.8%
<i>Scifinder Activity</i>	<i>100</i>	<i>100</i>	<i>11.1%</i>
<i>Total Points</i>		<i>900</i>	<i>100%</i>

Grade	Range	Grade	Range
A	100 – 94 %	C-	<74 – 70%
A-	<94 – 90%	D+	<70 – 67%
B+	<90 – 87%	D	<67 – 64%
B	<87 – 84%	D-	<64 – 61%
B-	<84 – 80%	F	<60 – 0%
C+	<80 – 77%		
C	<77 – 74%		

Note: Final grades and percentage ranges are subject to change by the instructor

Students are expected to retain all returned graded materials until final grades are assigned at the end of the course. Please keep all graded assignments that are returned to you until a final grade has been assigned for the course. It is YOUR RESPONSIBILITY to check for grading errors. Individual scores will be posted on Canvas as soon as they become available.

Laboratory Safety: Safety in the laboratory requires that the student pays attention to the basic laboratory skills, techniques, personal protective equipment (PPE), and handling of chemicals with various levels of associated hazard and

toxicity. The University has taken the necessary steps to minimize students' exposure to hazardous chemicals, fumes and potential accidents in lab by equipping chemistry labs with fumehoods as well as providing safety procedures to ensure best practices in labs. We expect you to embrace and follow all safety procedures outlined in each experiment and use the fumehoods provided. Failure to comply can result in the student receiving a zero for that lab and repeated neglect and problems can lead to a fail grade (F) for the course.

Attendance: Regular attendance is compulsory. You must be in the lab at the assigned starting time to receive full credit for the lab. **There will be no makeup labs**

Remote Partners: Labs will be in partners (in-person and remote) and I expect both partners to work effectively together. Every remote partner must be present and active via zoom. He or she must communicate constantly with the in-person lab partner. Remote partner must take screenshots of every key step during the reaction setup, running of the reaction, reaction workup, and analysis of product. The remote partner must submit a pdf file of screenshots, observation made with timestamps, and a participation analysis/report from zoom 1 hr. after the lab. Failure to submit the file will cost 70% of the points for that lab. Also, the in-person partner can generate from their account after each lab.

<https://udenver.zoom.us/account/report>

Academic Integrity:

While I advocate collaborative learning and teamwork, I also firmly believe that everyone should maintain the highest ethical standards. As such, I support and will strictly enforce the Honor Code of the University of Denver. www.du.edu/honorcode.

Honor Code Statement.

All members of the University of Denver are expected to uphold the values of *Integrity*, *Respect*, and *Responsibility*. These values embody the standards of conduct for students, staff, faculty, and administrators as members of the University community. These values are defined as:

Integrity: acting in an honest and ethical manner;

Respect: honoring differences in people, ideas, and opinions;

Responsibility: accepting ownership for one's own conduct.

Pioneer Pledge.

As a University of Denver Pioneer, I pledge:

- to act with INTEGRITY and pursue academic excellence;
- to RESPECT differences in people, ideas, and opinions and;
- to accept my RESPONSIBILITY as a local and global citizen;

Because I take pride in the University of Denver I will uphold the *Honor Code* and encourage others to follow my example

Labs:

Note - the labs might change

Date	Lab		Assignments Due	Reading (techniques book)
Wk1	Introduction to Organic chemistry lab , Safety, and Syllabus			Chapter 1
Mon	SciFinder Activity			
Tues	Lab 2	Williamson Ether Synthesis	Pre-lab 2 (20 pt)	See Pre-Lab
Wed	Lab3	Heck Reaction	Pre-lab 3 (20 pt) Post-lab 2	See Pre-Lab
Wk2 - Mon	Lab 4	Domino Reaction	Pre-lab 4 (20 pt) Post-lab 3	See Pre-Lab
Tues	Lab 5	Polymer	Pre-lab 5 (20 pt) Post-lab 4	See Pre-Lab
Wed	Lab 6	Dyes	Pre-lab 6 (20 pt) Post-lab 5	See Pre-Lab
Wk3 - Mon	Lab 7	Drug Design	Pre-lab 7 (20 pt) Post-lab 6	See Pre-Lab
Tues		Project_Crystal Lab_Design	Post-lab 7	Submit project Friday