

Instructor: Dr. Ogar Ichire
TA:
Office: Olin 205A
Email: ogar.ichire@du.edu
Office hours: Email me

Lab meets: Mon - Fri

Lab: Online

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**)
Technology: High-Speed Internet and laptop or computer

Essential Materials:

Technology: Printer, Scanner(or scanner apps)

Additional References available: [Scifinder-n](#) [WebMO](#) <https://www.organicdivision.org/links/> [Synthetic Organic Chemistry](#).

Course Philosophy:

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

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

1. Know and use standard lab techniques – most of which was covered in Organic lab I & II
2. Know and use basic analytical tools, techniques, and instrumentations. In addition to the interpretation of spectrum and data. (Organic lab II)
3. Use and critically analyze chemical literature.
4. Communicate scientific issues in writing.
5. Apply current chemical theory and content to solving problems.
6. Investigate some applications of organic chemistry.

Skills 3 to 6 will be useful this quarter because most of (if not all) our labs will be online and even the projects would involve using online or downloadable computational tools and online literature to develop new ideas and applications. We will learn how to use a few computer programs, online servers and databases to achieve the labs this quarter. All labs can be accomplished online with computers and a reliable high-speed internet connection.

Organic Chemistry III Laboratory

We will begin with virtual labs this quarter to examine several named reactions from organic chemistry II and at the same time work on two new reactions from Ochem III. Then the rest of the labs will focus on learning how to use a scientific database, a few computer programs, and online computational servers and websites. The knowledge you gain from these online applications will be helpful in week 4 when we begin work on two research projects. Both projects will involve literature search, computational work, creative ideas and inputs, PowerPoint presentation and a final report. Note that all the labs in Ochem III will be standalone - this simply means that the materials you will encounter in the lab might not have been covered in class but we expect you to research the assigned concepts and topics and find the necessary tools to meet the lab expectations. For each lab, apart from the research project labs, you will be provided with resources and links in the lab procedure and the TA will upload prelab lectures video to guide you each week. Furthermore, you will learn how to use a valuable database to search for useful chemical information and I will advise you to consult the Loudon textbook and online resources to complement the lab materials.

For the lab projects, a good place to obtain primary chemical information is a scientific database called SciFinder (now SciFinder-n). The lab activity on SciFinder-n will demonstrate how to search for known compounds, chemical properties,

reaction procedures, chemical vendors, analytical data, and how to research scientific topics. Likewise, you can use SciFinder-n to conduct retrosynthesis of a target molecule, estimate cost of the chemicals and reagents, locate vendors and their website and from there view the Safety Data Sheet (SDS) for a chemical and learn more about other useful properties of the chemical as well. Typically, a good literature search is a natural first step performed by an organic chemist researcher before heading to the lab to run any reaction – and we will focus more on literature work than wet-lab this quarter. And so, the SciFinder database would be key for our projects this quarter. Google Scholar is another popular web search engine also used by chemists to explore scholarly literature across many related disciplines, databases, and sources. Though we will not be dwelling much on Google Scholar this quarter, it is worth mentioning here that it is a free tool and a good starting place to search for articles and we will touch on the search results using this mining engine in our SciFinder activity.

You can also use other resources provided by the university particularly the University of Denver Library Compass search engine, which will give you access to additional databases including SciFinder-n, articles, books and other resources the university provides to faculty and researchers at DU.

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 or a MS-Word (or PDF) document that can be uploaded to Canvas. Note that each prelab will include a reading assignment that introduces you to the lab topic and a summary of your understanding will be required as part of the prelab. I expect you to complete this reading each week. For the lab projects, you will read a couple of research papers and plan your approach to the problem with your group member(s).

There will also be a lab-lecture based paper for you to read and write a review each week as part of the prelab.

Doing the Lab:

The labs will be conducted online and if possible, at the scheduled time in PioneerWeb, but I believe all labs will be asynchronous because of the different time zones and locations of students. The TA will record a prelab video each week and post it on Canvas for all the online labs. As such, the university scheduled 3 hours (or split 3 hours over days) for the lab will be used to answer questions and help students with their labs via ZOOM sections each week. Your TAs will inform you of these hours during the first week of lab and his or her availability to for the week. In addition, the TAs will also work out office hours for students who cannot attend the weekly ZOOM sections – I will encourage group office hours to lighten the load on the TAs and to help them better plan their time. The labs will still be in groups of two or three (all collaborations are online) but assignments and post labs should be submitted separately via Canvas and they will be checked for plagiarism. So, independent work, before and after group efforts, is highly encouraged. The only exception to this requirement will be for PowerPoint presentations when the groups will all receive the same points for their presentation and are encouraged to work together productively to get a good score.

Post-lab assignments (Reports):

Each lab will have a post-lab assignment or progress report due each week on Canvas according to the schedule (check with your TA). Post-labs should be typed unless told otherwise. Turned in late post-labs or reports will lose points according to the following guidelines: 1-day late reports will lose 10 points; two or more days late reports will lose 50% of the points; no lab reports or post-lab will lose 100% points.

Course Grading:

Your score in the course will be determined using the point system below and it subject to change:

<i>Areas evaluated:</i>	<i>Freq × Points</i>	<i>Total Points in Area</i>	<i>Percent of Grade</i>
<i>SciFinder Activity</i>	100	100	10%
Pre-lab (Reading summary is worth 10 pts)	2 × 40	80	8 %
LLRP (Lab-Lecture Research Papers)	8 × 10	80	8 %
Post-lab or Reports	2 × 60	240	24 %
Presentation	2 × 100	200	20%
Lab Project Reports	2 × 150	300	30%
<i>Total Points</i>		<i>1000</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

Retain all returned graded coursework until final grades are assigned at the end of the course. Please keep all graded assignments until a final grade has been assigned for the course. Also, it is YOUR RESPONSIBILITY to check for grading errors. Your scores will be posted on Canvas as soon as they become available.

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.

Labs:

Note - the labs might change

Date	Lab		Assignments Due	Reading (techniques book)
Wk1	Introduction to Organic chemistry lab III Syllabus, SciFinder-n Activity and Online Tools			<i>Chapter 1</i>
Wk2	Lab 1	Online Labs: DA Reaction FC Reactions, Reductions and Esterification	Prelab 1	<i>Loudon Text</i>
Wk3	Lab2	SciFinder-n Activity	Postlab: Online Lab, LLRP1	<i>SciFinder-n</i>
Wk4	Lab 3	Computations: Organic Reactivity	Pre-lab 3, LLRP2 Post-lab2	<i>WebMO</i>
Wk5		Projects	Progress Report 1, LLRP3	<i>Research papers</i>
Wk6		Project	Progress Report 2, LLRP4	<i>Research papers</i>
Wk7		Presentation I	Presentations I, LLRP5 Project Report I	<i>Research papers</i>
Wk8		Project	Progress Report 1, LLRP6	<i>Research papers</i>
Wk9		Project	Project Report II, LLRP7	<i>Research papers</i>
Wk10		Presentation II	Presentations II, LLRP8 Project Report II	