CHEM 2461-1 **Organic Chemistry Lab I** **Autumn 2019**

Instructor: Dr. Ogar Ichire (Leo)
TA:
Office: Olin 205A
Phone: 303-871-2985
Email: ogar.ichire@du.edu
Office hours: Open door

Lab meets: Monday – Friday

Lab: Olin 232

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 splash ***goggles*** and ***lab coat*** during lab - both can be purchased online.
A laboratory notebook (see lab notebook requirements)
Canvas Access (labs and post labs will be posted to Canvas)

Additional References available:

https://www.organicdivision.org/links/

Course Philosophy:
This course is designed with the educational goals and the 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 their immediate community and the world in general. Our 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, and to prepare for vocations 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.
2. Use and critically analyze chemical literature.
3. Communicate scientific issues in writing.
4. Apply current chemical theory/content to solving problems.

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

1. Introducing common techniques, setups, and procedures used in chemistry for synthesis and characterization of organic compounds. You will be introduced to new techniques with each lab and it is expected that you develop an understanding of the chemical basis for each technique. A description of the technique and procedure will be included in your pre-lab assignment. The first day of lab will begin with appropriate safety precautions and procedures and you will be given a safety quiz if applicable. At the end of the course a cumulative test on lab techniques will be given, or you will perform a lab encompassing various lab techniques.
2. We will use the chemistry reference materials (Safety Data Sheets) to identify chemical properties and hazards associated with each chemical that we use and make in lab. 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 assignment which will ask you to effectively communicate your lab results, interpret the results, and explain the relevant chemical theories associate with the lab.
4. The development of green chemistry has been proposed to mitigate some of the problems in our world community. We will discuss green chemistry in relation to our laboratory work. You will be asked to analyze lab procedures to illustrate green principles.

Organic Laboratory
Since this organic chemistry laboratory is designed to help you learn lab skills it is important to attend lab on-time, prepared, and equipped to complete lab. Assessment of your laboratory work will be graded on pre-lab assignments due at the beginning of a lab, lab performance during lab, and post-lab assignments on the lab. Also, to ensure that you are mastering lab techniques and basic reaction setups, you will be tested on the major lab skills throughout the semester and at the end with a lab final.

Parts of a Lab Assessment

Pre-lab assignments: **Read chapter ONE of the techniques book (Compulsory)**
Each lab will have a pre-lab assignment completed in your laboratory notebook. The laboratory notebook handout provides the structure for what is required of each pre-lab assignments. These assignments are designed to help you with the following: understand new lab techniques, complete lab in a timely fashion, and to ensure safety. Therefore, pre-lab question assignments will be due at the **beginning** of the assigned lab period. No credit will be given for late work.

Lab Performance: **Read chapter TWO TO FIVE of the techniques book (Compulsory)**
This grade reflects your preparedness for lab, attention to lab techniques, safety, cleanliness, and your success in the lab. You will lose points for behaviors that violate safety rules and/or demonstrate poor lab skills. For example, not having a lab procedure ready, use of cell phone in lab, spilled chemicals, unlocked drawers, inappropriate conduct, using equipment incorrectly will result in you missing points in this section. Please see the lab performance rubric for more details. In addition, the instructor reserves the right to ask any student who creates a serious safety hazard to leave with zero credit for the lab.

Post-lab assignments (Reports):
Each lab will have a post-lab (or report) assignment due at the **beginning** of a lab period according to the schedule. **Post-labs should be typed unless noted**. Late lab reports will lose points according to the following guidelines: 1 day late minus five points, 2 days late minus 10 points, and a week from the due date minus 30 points. No lab over 7 days late will be accepted.

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

Areas evaluated:	*Frequency × Points*	*Total Points in Area*	*Approximate Percentage of Grade*
Pre-lab	8 × 20	160	16 %
Lab performance	8 × 25	200	20 %
Lab skills (techniques)	8 × 25	200	20 %
Post-lab	8 × 30	240	24 %
Safety Monitor (compulsory)	50	50	
Lab Final	50	50	10%
Safety Exercise and Chemical information hunt	100	100	10%
Total Points		*1000*	*100%*

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 coursework 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:

Mastery of chemistry requires that you know basic laboratory skills and the handling of chemicals with various levels of associated hazards. The University has taken the necessary steps to minimize student risks by equipping chemistry labs with the necessary equipment and gadgets that lower student exposure to hazardous chemicals as well as a vibrant set of safety procedures and requirements for students to follow before and during lab periods. However, students need to embrace and follow all safety measures outlined for each laboratory and consult the safety data sheet (SDS) for each chemical used or produced. Failure to comply can result in the student receiving a zero for that lab and repeated problems can result in an F grade in the course.

Attendance:

Regular attendance is expected. You must be in the lab at the assigned starting time to receive full credit for the lab. If you miss a lab, please contact the instructor for alternate arrangements. If time and space allow, you can make up the lab in another section, otherwise you may earn no credit for a missed lab. **Note**: missed lab techniques must be scheduled with the instructor before the next lab (a written quiz or assignment may be substituted); post-labs due during a missed lab are still due that day or will be late per the late assignment policy.

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

Lab Due Dates:

Date	Lab		Assignments Due	Reading (techniques book)
Wk1	Introduction to Organic chemistry lab Safety, and Syllabus			*Chapter 1*
	Introduction to Organic chemistry lab Check-in and organic chemistry reactions			*Chapter 2-3*
	Computational Chemistry (Comp1)			*Chapter 8*
WK2	Lab 1A & 2A	Solubility and Miscibility Exploration	Pre-lab 1A & 2A (20 pt) Comp1	*See Pre-Lab*
WK3	Lab 1 Part B	Unknown Solid	Pre-lab 1B (20 pt) L1	*See Pre-Lab*
WK4	Lab 2	Colorful extraction	Pre-lab 2B (20 pt) Post-lab 1	*See Pre-Lab*
WK5	Lab 3	Spinach chromatography *(Subject to change)*	Pre-lab 3 (20 pt) Post-lab 2	*See Pre-Lab*
WK6	Lab 4	Synthesis of Salicylic acid from Wintergreen oil	Pre-lab 4 (20 pt) Post-lab 3	*See Pre-Lab*
WK7	Lab 5	Competitive Nucleophiles *(Subject to change)*	Pre-lab 5 (20 pt) Post-lab 4	*See Pre-Lab*
WK8	Lab 6	Green Oxidation	Pre-lab 6 (20 pt) Post-lab 5	*See Pre-Lab*
WK9	Lab 7	Optical Activity and Refractive Index	Pre-lab 7 (20 pt) Post-lab 6	*See Pre-Lab*
WK10		Final	Post-lab 7	