

CHEM 235 - Organic Chemistry Lab A & B

Fall 2022

Time: Lab A Thursday, 1:10-4:00 pm & Lab B Friday, 1:00-3:50 pm

Location: Caputo 331

Lab Instructor: Dr. Maria Schiza ◦ maria.schiza@millersville.edu ◦ **Office:** Caputo 219, tel.# 717-871-7437

Office Hours: Mon, Wed: 9-10:30 am & Thu, Fri: 9-10 am

Alternative times can be scheduled by appointment or virtually through Zoom.

Lab Description and Objectives

The lab in CHEM 235 provides the opportunity for organic chemistry students to develop hands-on technical skills and safe work habits.

AT THE COMPLETION OF CHEM 235 LABORATORY, YOU SHOULD BE ABLE TO...

1. Demonstrate proper laboratory safety & waste disposal when working in the lab.
2. Keep a neat and organized record of laboratory data in a notebook.
3. Set up apparatus for experimental techniques: reactions, distillations, filtrations, etc.
4. Purify organic products by recrystallization (solids) and distillation (liquids).
5. Characterize organic products by physical, chemical, and spectroscopic properties

This course syllabus outlines the agreement between instructor and student for the duration of the semester. The schedule is subject to change (i.e. due to inclement weather or unforeseen circumstances), but the course policies are NOT.

Required Materials for Lab

1. **Over Glasses Safety Glasses** - <https://tinyurl.com/wepv6ra3>
or **Regular Safety Glasses** - <https://tinyurl.com/3cdrit3z>
2. **Life Sciences Lab Notebook Carbonless** (100 Sheet Set) TOP PAGE PERFORATED —
<https://tinyurl.com/uh2v94x3> ISBN: 978-1930882096
3. **A COMBINATION LOCK – NOT A KEY LOCK!**
4. **Blue/Black Pen**
5. **Molecular Model Kit for Organic Chemistry (same as for lecture):** ASIN: B01NCU854K on Amazon,
<https://tinyurl.com/ModelKit22>
6. **Regular use of D2L to access lab materials**

Note: You MUST purchase the required lab notebook. Up to **10%** will be deducted from each lab that you do not have the correct lab notebook.

Lab Policies

- **Attendance:** Students must complete every experiment. If you cannot attend a scheduled lab for reasons in the University-Approved Guidelines, please contact your instructor as soon as possible to arrange an alternate time.
- **Academic Honesty:** Students are expected to conduct all work in an honest and ethical manner consistent with University policy. Labs are carried out with a partner and discussion of results, concepts, and analysis is encouraged. However, all written work must be independent work.
- **Safe Environment:** Lab instructors help guide your experimentation. You are expected to follow all directions regarding safety precautions and lab attire. Your eyes, legs, and feet should be covered at all times, and gloves worn as recommended. Please notify your instructor of any special concerns (allergies or pregnancy) that might require alternate arrangements for your work. You must also keep lab equipment and spaces clean and tidy. Failure to follow these rules may incur a **5%** penalty on the week's assignment.
- **Cooperative Environment:** Students are expected to be actively engaged in the classroom, so questions and comments are encouraged. Repeated disruptive behavior (like tardiness, chatting, or electronic noise/use) may be cause for dismissal from lab and may affect final grade assignments. Students with special concerns are encouraged to speak with me or take advantage of student resources available on campus, including the Office of Learning Services (end of syllabus), the Tutoring Center, or the Counseling Center. The safe and productive educational environment for this class includes compliance with Title IX as outlined in Millersville's policy (end of syllabus).

Lab Expectations

Students are expected to come to class each week with an understanding of the basics for the planned lab. All recordings for wet labs must be completed in the lab notebook. You must hand in all lab reports in order to pass the lab portion of the class.

For Wet Labs: The Lab Notebook Needs to Include:

1. **Table of Contents:** Maintain a list of titles and pages for each lab.

Before Lab

Pre-Lab Work: Pre-lab work, outlined in the instructions, must be completed in the lab notebook and written legibly in **black or blue ink**, before lab begins. Carefully read and understand the experimental procedure and plan your lab work **before** the lab period. **Pre-lab work may be one column across the whole page.**

2. **Pre-Lab Work should include:**

- **Title:** Start recording each experiment with its title on a new page.
- **Date:** Record the date on which work is done. Add a second date as appropriate.
- **Pre-Lab Assignments:** Complete as instructed.
- **Procedure Steps:** after the pre-lab assignment is completed, divide your lab notebook in two columns. Write the procedure steps (**black or blue ink**) on the LEFT column in a bulleted format.

During Lab

In-Lab Work: should be neat, completed in the lab notebook and **written legibly in black or blue ink in the two-column format.** Observations and data collection and recordings made on the RIGHT and procedure steps made on the LEFT (already done as pre-lab work).

3. ***In-Lab work should include: (to be completed during lab)***

RIGHT COLUMN

- **Primary Data:** Relevant information **MUST** be recorded as you do each experiment. This portion of your notebook does **NOT** need to be neat but must be complete and clearly labeled.
- **Collected Data:** Record **ALL** data, observations, or measurements from the experiment directly into your notebook. Each person must have **ALL** data recorded by hand in their own notebook.

LEFT COLUMN

- **Experimental Record:** On the LEFT column, you should add notes about any changes made to the procedure or any problems that arose and may have affected your results.

After Lab

Post-Lab Work: Post-lab work (data analysis and post-lab questions/assignments) **should be written in the lab notebook (legibly in black or blue ink). Post-Lab work may be one column across the whole page.**

Final Lab Reports

Final Lab Reports: Your final lab report includes all pages from your notebook for each wet lab: prelab-work, in-lab work (collected data, analysis and interpretation of data for the lab, supporting spectra), and post-lab work/questions/assignments. Due weeks are listed in the lab schedule table below. All final lab reports need to be scanned and made into a single pdf file for submission to a D2L assignment folder.

- Final lab reports also need to be submitted for dry lab packets/worksheets, as single pdf files to a D2L assignment folder (only the NMR packet is to be submitted as a hard copy).
- Credit will be deducted for “late” reports. All lab reports should be submitted (even if they are late) in order to pass the course. Late submission may incur up to **5%** penalty per day, unless previously arranged with the instructor.

Grading

Each experiment will be graded out of **100%**

All experiment scores will be used to determine a **lab average%**

The lab grade for CHEM 235 is 20% of your total course grade

Lab Schedule

This schedule is tentative and subject to alteration by inclement weather and instructor discretion. Each lab is due during your lab period of the week indicated in 'Due' column. **Wet labs are bolded.**

Thursday - LAB A Schedule

	To be carried out Week of:	Due Week of:	
Lab / Activity	Thursday Lab A	Thursday Lab A	Friday Lab
LAB 1. Safety, Check-In, Functional Groups & IR Spectroscopy	Aug. 25 (week 1)	Sept. 1 (week 2)	
LAB 2. Recrystallization	Sept. 1 (week 2)	Sept. 8 (week 3)	
LAB 3. Thin Layer Chromatography (TLC)	Sept. 8 (week 3)	Sept. 15 (week 4)	
LAB 4. Limonene Extraction via Steam Distillation	Sept. 15 (week 4)	Sept. 22 (week 5)	
LAB 5. Acid-Base Reactions & Acid-Base Extraction	Sept. 22 (week 5)	Sept. 29 (week 6)	
LAB 6. Conformational Analysis, Chirality, & Stereochemistry (*Bring Molecular Model Kit)	Sept. 29 (week 6)	Oct. 6 (week 7)	
LAB 7. Gold(III)-Catalyzed Hydration of Phenylacetylene & TLC	Oct. 6 (week 7)	Oct. 13 (week 8)	
LAB 8. Proton & Carbon NMR	Oct. 13 (week 8)	Oct. 27 – hand in the NMR as a hard copy (week 10)	
LAB 9. Proton & Carbon NMR	Oct. 20 (week 9)		
LAB 10. Oxone oxidation of an aldehyde into a carboxylic acid	Oct. 27 (week 10)	Nov. 3 (week 11)	
LAB 11. Acid cat. cyclic acetal formation from benzaldehyde and pentaerythritol	Nov. 3 (week 11)	Nov. 10 (week 12)	
LAB 12. Imine Formation from an Aldehyde (Multi-Step Synthesis – Step 1)	Nov. 10 (week 12)	Dec. 1 (week 15)	
LAB 13. Imine Reduction & Amide Formation (Multi-Step Synthesis – Steps 2 & 3)	Nov. 17 (week 13)		
THANKSGIVING BREAK	NO LAB on Nov 24 (week 14)		
Clean-up, Check-out	Dec. 1 (week 15)		

Friday - LAB B Schedule

	To be carried out Week of:	Due Week of:
Lab / Activity	Friday Lab B	Friday Lab B
LAB 1. Safety, Check-In, Functional Groups & IR Spectroscopy	Aug. 26 (week 1)	Sept. 2 (week 2)
LAB 2. Recrystallization	Sept. 2 (week 2)	Sept. 9 (week 3)
LAB 3. Thin Layer Chromatography (TLC)	Sept. 9 (week 3)	Sept. 16 (week 4)
LAB 4. Limonene Extraction via Steam Distillation	Sept. 16 (week 4)	Sept. 23 (week 5)
LAB 5. Acid-Base Reactions & Acid-Base Extraction	Sept. 23 (week 5)	Sept. 30 (week 6)
LAB 6. Conformational Analysis, Chirality, & Stereochemistry (*Bring Molecular Model Kit)	Sept. 30 (week 6)	Oct. 7 (week 7)
LAB 7. Gold(III)-Catalyzed Hydration of Phenylacetylene & TLC	Oct. 7 (week 7)	Oct. 14 (week 8)
LAB 8. Proton & Carbon NMR	Oct. 14 (week 8)	Oct. 28 – hand in the NMR as a hard copy (week 10)
LAB 9. Proton & Carbon NMR	Oct. 21 (week 9)	
LAB 10. Oxone oxidation of an aldehyde into a carboxylic acid	Oct. 28 (week 10)	Nov. 4 (week 11)
LAB 11. Acid cat. cyclic acetal formation from benzaldehyde and pentaerythritol	Nov. 4 (week 11)	Nov. 11 (week 12)
LAB 12. Imine Formation from an Aldehyde (Multi-Step Synthesis – Step 1)	Nov. 11 (week 12)	Dec 2 (week 15)
LAB 13. Imine Reduction & Amide Formation (Multi-Step Synthesis – Steps 2 & 3)	Nov. 18 (week 13)	
THANKSGIVING BREAK	NO LAB on Nov 25 (week 14)	
Clean-up, Check-out	Dec 2 (week 15)	

LEARNING ACCOMMODATIONS

Please see the Office of Learning Services in Lyle Hall (<http://www.millersville.edu/learningservices/>) as soon as possible if you have special learning needs for this class. If you have a condition that may affect your ability to perform laboratory exercises, to exit lab safely from the premises in an emergency, or which may cause an emergency during class, or lab, please discuss this in confidence with your instructor and someone at the Office of Student Support Services. Appropriate accommodations may then be provided.

Title IX Statement

*Millersville University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to comply with the requirements of Title IX of the Education Amendments of 1972 and the University's commitment to offering supportive measures in accordance with the new regulations issued under Title IX, the University requires faculty members to report to the University's Title IX Coordinator incidents of sexual violence shared by students. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. **Faculty members are obligated to report to the person designated in the University [Protection of Minors policy](#) sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred.***