Syllabus

O-Chem Lab I, CHEM 222, summer 2022

# Welcome

This class welcomes participation from any student who has satisfied the appropriate prerequisites, described below. Students journey to this course along many different pathways with a range of abilities, skills, knowledge, experiences, and expectations. We invite students to ask questions. Asking questions helps to clear the path of obstacles for you and for others. Your input contributes to a healthy teaching and learning environment. Diverse intellectual engagement helps your teachers to thoughtfully construct educational materials, instructions, delivery style, and thereby grow professionally. Contact me, christine.dimeglio@yale.edu, to discuss strategies for your best performance. With respect to materials required for in-person participation, don’t let finances or slow postal delivery stand in your way. If you need a lab coat, reach out.

# Instructor

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# Preceptor

Dr. Aaron Clark, aaron.m.clark@yale.edu

## Staff

Teresa Lara-Jaime, teresa.lara.jaime@yale.edu, Manager, Undergraduate Teaching Lab

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# Course Description

In Organic Chemistry Lab 1, CHEM 222L, summer 2022, students engage with concepts, trainings, and skills required for safe and effective chemical laboratory work. We accomplish this by focusing efforts on eight teaching and learning areas: safety, scientific reporting, chemical information literacy, spectroscopic analysis, non-spectroscopic analysis, standard bench techniques for separation and purification, and synthesis of organic compounds, drawing connections between laboratory procedures and reaction mechanisms. Evaluation of student work is an ongoing process, with the aim of continual improvement and ultimate proficiency in all skill areas. Evaluative tools include prelab and post-lab assignments, lab notetaking, reports, and quizzes. Students are required to be available for the entire laboratory period for both live and remote sessions.

## Prerequisites

The Department of Chemistry strictly enforces prerequisites for chemistry laboratory courses.  Students must have received a grade for General Chemistry CHEM 134L and 136L, or their equivalents, such as a college course elsewhere or the Chemistry Department placement exam. Organic Chemistry Lecture I (CHEM 220 or CHEM 174 or their equivalents) is a pre-requisite or co-requisite. When in doubt, contact the instructor or the DUS of chemistry

# Covid Statement

The organic chemistry lab operates in such a manner to ensure that students, teaching assistants, instructors, and support staff are safe in the time of Covid-19. This includes daily decontamination, appropriate PPE, social distancing in the lab.

# Course Location and Hours

* Organic Chemistry Labs take place in Room 233 Sterling Chemistry Lab (SCL 225 Prospect Street, 3rd floor).
* The lab course runs on both Tuesday and Thursday afternoons, from 12:30-4:30pm.
* Students attend both lab sessions for each of the 5 weeks of the summer session. Students need to be available for the entire laboratory period with no overlap with other courses, job, volunteer, or research commitments.

# Canvas

### Canvas is the learning management platform used to facilitate communication of all course content.  The important features of our course Canvas site that enable us to work together effectively include:

* **Syllabus:** The syllabus serves as a roadmap for the course, describing required materials and outlining the schedule/due dates for content, assignments, and quizzing. It also describes policies about enrollment, grading, penalties, attendance, academic integrity and citing sources.
* **Announcements:** Important course information is posted here for the group and delivered to your Yale email account.
* **Modules:** Modules, organized by lab week, organizes all curricular course content including links to prerecorded materials, assignments and assessments.
* **Assignments:** This Canvas tool allows students to submit course work for grading.
* **Grades:** Students are able to access feedback on their submitted assignments using this tool.

# Required Materials

1. Lab textbook:Techniques in Organic Chemistry, Jerry Mohrig, *et al*., W.H. Freeman and Company, 4th edition, ISBN: 9781464134227**.** Buy online or at theYale Bookstore. The electronic version is fine. An older version is fine.
2. Lab notebook, capable of making copies to hand in to your lab instructor. 9781930882003   Student Lab Notebook by Hayden-McNeil Publishing Company. A previously used notebook is fine but it need to have a self-copying feature.
3. Technology that allows access to Canvas, Zoom, Word, Excel. The ability to convert student work to pdf files and the ability to use Google Chrome or Mozzilla for taking Canvas quizzes.

1. Personal face coverings, worn in all public spaces.
2. Long Lab Coat: It must go to the knee!  THIS IS NOT AN OPTION.  Do not buy short lab coats.  Buy it at the Yale Bookstore or from an online vendor. [https://yale.bncollege.com/School-Supplies-ArtTech/Uniforms/Labcoats/Jackets/Fashion-Seal-Unisex-41-Lab-Coat/p/284925830](https://nam12.safelinks.protection.outlook.com/?url=https%3A%2F%2Fyale.bncollege.com%2FSchool-Supplies-ArtTech%2FUniforms%2FLabcoats%2FJackets%2FFashion-Seal-Unisex-41-Lab-Coat%2Fp%2F284925830&data=04%7C01%7Cchristine.dimeglio%40yale.edu%7C41b372bd5de742f768e108d9f7019ca6%7Cdd8cbebb21394df8b4114e3e87abeb5c%7C0%7C0%7C637812408568627600%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000&sdata=PklkZ1KmgJZhEnv%2FvfzaRDU61XmHfwPpKNCCepMuH0k%3D&reserved=0)
3. Proper Clothing: pants that cover legs and ankles (no shorts, skirts or Capri), shoes that cover the ENTIRE foot (no sandals, flip-flops or ballet type), no earbuds or headphones.  If you are in lab with improper clothing, you will need to leave, and continue with the remote lab.
4. **LOCK for backpack/coat lockers.** Backpacks and coats are not permitted in lab. The lockers are located in the hallways outside of the lab rooms. Protect your belongings from thieves! However, you must remove your lock and your belongings at the end of lab.
5. Thick Sharpie Markers® for writing on glassware.

# Materials Supplied by the Lab

1. Course Packet is published on canvas/Modules/Course Packet and contains all information of importance to this lab course.
2. Protection for your electronic devices while in the lab (plastic wrap)
3. Nitrile gloves
4. Loner lab coats if you spill something on yours while in lab.
5. Disposable surgical masks for lab use only.
6. Lab safety glasses/goggles

# Assignments

A tentative schedule of activities and the due dates of related assignments appears at the end of this syllabus. There are several types of assignments related to this course:

Experimental plans (EP): Students must submit an EP as a ticket to perform the experiment, and there can be no exceptions for the sake of student and staff safety. Late EPs are penalized 10 points.

Lab notes (LN): Students take notes during lab and the notebook is signed by the instructor before departure.

Post lab assignments (PL): Post lab assignments require reading of assigned primary literature, and thoughtful response to a series of questions about the experiments performed in lab.

Quizzes (Q): Students take quizzes on Thursdays in the open window of 5pm to 11:50 pm. Quizzes are 10 to 15 minutes in length, short answer or multiple choice, delivered by Canvas. If a student missed their quiz, they receive a 25% penalty and another opportunity to take the quiz on the following day.

IR Worksheet (IR): Performed in class and submitted before departure.

# Grading

Letter grades are assigned at the end of term by the instructor. A student that attends all scheduled sessions, submits all work on time, makes a good faith effort in all areas of work, typically earns grades B- and better.

Grades are calculated as [total points earned – penalties]/total points available, with scaling applied if/when required. Several types of assignments contribute to letter grades. Broadly, the weighting of assignments is

* + Proper preparation, full participation, submission of related documentation and assignments (~65-70%)
	+ Quizzing (~30-35%)

# Grading Penalties Include

1. Submitting graded assignments after the due date/time. The penalty is 5% per day beginning at the due date/time. Work is always due on your regularly scheduled lab day, even if you are sick. This policy prevents what we call, “illness of convenience”. If you have an exceptional situation, let’s talk.
2. Unexcused absence from lab or scheduled zoom sessions. -20 points per session.
3. Failure to submit assignments graded as complete/incomplete -10 points or full point value, which ever is higher.
4. Missing a scheduled quiz. If you miss a quiz, your quiz will be rescheduled for the next day and you will receive a 25% penalty on the point value of the quiz.

## Questions about graded assignments

Please ask for an explanation from your grader if you do not understand comments/deductions or if you think we made an error in your score.

# Academic Integrity

It is the goal of the Chemistry Department Teaching Staff to assist you in your personal and professional growth. Assignments and assessments are designed with this goal in mind. Breaches in academic integrity undermine our goals. Knowing the rules of academic integrity and applying those rules to your conduct, bench work and written submissions is integral to your advancement as a scientist. You will be asked to read and sign out academic integrity policy before we being working together.

# Schedule of Activities

* The schedule is a living document subject to change
* **All material for this course are available at Canvas/Modules/Week of Session**

## **Lab 1** A. Tour of Facility, Lab Safety, Check-in, Chemical Tables

## B. Solutions, Hood Training, Balances, Common Set-Ups for Experimentation

Due

* Viewing of Lab Safety Video (by noontime 5/31)
* Student Information Sheet, Academic Integrity Policy, Safety Contract (5/31 11:59pm)

## **Lab 2** Extraction for the Separation of Acidic and Neutral Organic Compounds

Due

* EP2 (noon, 6/2) 10points
* PL1 (Labs 1 and 2; 6/5 11:59pm) 25 points
* Quiz1 (Labs 1 and 2; 6/5 11;59 pm) 25 points

## **Lab 3** Recrystallization and MP Analysis

Due

* EP3 (noon, 6/7) 10points

## **Lab 4** TLC and Column Chromatography

Due

* EP4 (noon, 6/9) 10points
* PL2 (Lab 3 and 4; 6/12 11:59pm) 25 points
* QUIZ2 (Labs 3 and 4; 6/12 11:59 pm) 25 points

## **Lab 5** IR Spectroscopy

Due

* EP5 (noon, 6/14) 10points
* IR Worksheet (4:30 6/14) 25 points

## **Lab 6** Green Chemistry in Oxidation Reactions to Give Camphor

Due

* EP6 (noon, 6/16) 10points
* PL3 (Lab 6, 6/19, 11:59 pm) 20 points
* Q3 (Labs 5 and 6, 6/19, 11:59 pm) 25 points

## **Lab 7** Methyl Salicylate to Salicylic Acid

Due

* EP7 (noon, 6/21) 10points

## **Lab 8** SN2 Reaction

* EP8 (noon, 6/23) 10points
* PL4 (Lab 7 and 8, 6/26, 11:59 pm) 30 points
* Q4 (Labs 7 and 8, 6/26, 11:59 pm) 25 points

## **Lab 9** SN1 Reaction

Due

* EP9 (noon, 6/28) 10points
* PL5 (Lab 9, 6/29, 11:59 pm) 20
* Q5 (Lab 9, 6/29, 11:59 pm) 25

## **Lab 10** Trimyristin from Nutmeg by Hot Solvent Extraction

Due

* EP10 (noon, 6/29) 10points
* LN 10 (4:30, 6/29) 15 points

### **End syllabus**