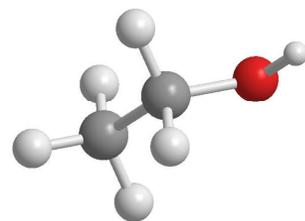


# Syllabus

## Organic Chemistry Laboratory - Chem 221L

### Emory University



“In theory there is no difference between theory and practice.  
In practice, however, there is.”  
- Jan van de Snepscheut

### Faculty

Consult OPUS or the Emory College Course Atlas for the name of the professor teaching your section.

The Learning Management System (LMS) used at Emory College is Canvas. The LMS is an integral part of the organization of this course and is required for all students. Use a search engine to find the Emory Canvas site.

This is a sample syllabus for Chemistry 221L at Emory University. The syllabus for a particular semester and section is available the course site on the LMS to registered students in the course.

### Textbook & Other Items

The lab manual, Chem 221L *Organic Chemistry Laboratory Manual*, is available in the University Bookstore and is required. A sharpie pen for marking glassware is suggested. You will use a chemical drawing software package called BioChemDraw in the ChemOffice Suite, and also Logger Pro. Instructions for downloading these programs are on the course LMS system.

### Safety glasses or safety goggles are required.

Federal law (rule 10 CFR 1910.133) requires the use of eye protection for all individuals in a laboratory. This applies to everyone occupying a lab, not just those working at any given moment. Everyone in lab must have closed-toe shoes (i.e., no sandals or flip-flops), and long pants.

### Attendance

You are expected to attend all sessions and to be on time. Lab always lasts 3 hours. To this end, you are graded on attendance and punctuality. You must arrive on time to hear the prelab lecture including instructions for safety and directions for waste disposal. Most sessions begin with a prelab quiz. Late students will potentially miss the quiz. **It is not possible to make up a prelab quiz. Ever.** If you have an excused absence, read and follow the instructions on the LMS to arrange a make up.

### Co-requisite

All lab students must be enrolled in CHEM 221 or CHEM 221Z (or have previously completed one of these courses or the equivalent 1<sup>st</sup> semester of Organic Chemistry).

## **Disabilities**

Students with disabilities who believe that they may need accommodations in this class & laboratory are encouraged to visit the Office of Disability Services as soon as possible to ensure that such accommodations are implemented in a timely fashion. When your accommodations are documented, please see the course instructor. Information is on the web site of the Office of Disability Services

## **General Procedures**

Unless specially requested in the experiment description or by your instructor, all lab work is done on an individual basis (not in pairs) though collaboration and consultation with your classmates is encouraged and even required. The laboratory session will typically begin with a prelab lecture. This lecture contains supplemental material important to understanding the background of your investigations and experiments. The lecture will not focus on the “how-to” aspects of the experiment at hand. You are responsible for learning the particulars methods and procedures for successful completion of an experiment before coming to lab. Prelab preparation is vital to success in this course.

## **Academic Honesty**

All of your assignments and experiments must be your original work. You are encouraged to collaborate with students while working on postlab assignments, but all work that you submit must be your own. Cheating also includes copying or using any data from another person without credit, falsifying data by alteration or invention, or in any way submitting work or data not actually as you measured it while performing the experiment in our laboratory during this semester.

## **Communal Spirit**

The success of a laboratory course of this size depends on the cooperation of each individual. For example, if you see a person without safety glasses, remind them to wear safety glasses. They would much rather hear this message from you than teaching staff. Be cooperative! Help the people who are having a tough time. This is not a place for competition. We must be sensitive to the crowded conditions and the need for everyone to maintain a reasonable pace in order to complete the experiments. For example, the balances must be kept clean. Stock solutions must be left in their proper place (uncontaminated) so that fellow students do not waste time looking for them.

## **Equipment Usage and Additional Safety Information**

Read the Safety section on your lab manual. You will have a safety quiz the second meeting of lab. You are responsible for the contents of your equipment locker. In the event of glassware breakage, contact your TA who will assist you in cleaning up the accident. All broken glassware should be placed in the broken glassware receptacle. Keep the work area free of debris. No trash or chemicals should be left on the bench tops. Store books and backpacks in the cubbyholes provided, NOT on the bench tops and not on the floor! Any equipment taken from the cabinets should be returned to its appropriate place. Leave chemical reagents where you find them. Never take reagent bottles to your bench. You must clean any spills and trash before leaving the lab. Your TA should check your workstation before leaving. Always remove your gloves before you leave the laboratory. Always.

## Schedule - Laboratory sessions last 3 hours and 20 minute.

Session	Activity
1	Experiment: Introduction to Safety. Laboratory Orientation & Check-In TLC Analysis of Pens
2	Experiment: Observation of an Organic Reaction Assignment Due (start of lab): TLC SAFETY QUIZ (and all reading from Chapter 1)
3	Experiment: What Is This Solid? Assignment Due: Synthesis of an Aleve Precursor
4	Experiment: What Is This Liquid? Lecture in Atwood 240 on Infrared Spectroscopy Assignment Due: Infrared Spectroscopy Problem Set
5	Experiment: Can You Identify Plastics? Assignment Due: What Is This Solid?
6	Experiment: What is in a Bic Lighter? (enter data after lab or within 48 hours) Start Fermentation for next week Assignment Due: Liquid Wiki
7	Experiment: Can You Make Ethanol for Use as a Biofuel? On-Line lectures: Distillation Practice & Distillation Theory Assignment Due: Bic Lighter
8	Experiment: How Do You Learn About the Mechanism of a Reaction? (enter data after lab) Assignment Due: Distillation (ethanol)
9	MECHANISM DISCUSSION and complete laboratory experiment above Assignment Due: Mechanism
10	Experiment: How Can You Isolate the Essential Oil From a Plant? Assignment Due: Plastics Wiki
11	Experiment: Essential Oils From a Plant (continued) Assignment Due: Essential Oils
12	Finish Lab Work and Check Out of lab The Theory and Practice Test (90 minutes)

## Lab Cleanup

In the organic chemistry teaching labs you are expected to take care of the equipment and lab space that you use. Each lab period, each individual has five possible points for lab clean up. Those points are awarded to the whole class as a group. If the lab is left in disarray after your lab, you and everyone else in your section just lost points for lab clean up. *A good rule of thumb is that if there are things that your TAs must clean up then your lab has lost points.* The following is a list of things that are expected of you:

1. No spilled chemicals and no trash in hood or at workstations.
2. Balances are clean (all chemicals brushed off) and used weigh paper is put in disposed of properly.
3. Sink areas – clean, organized, and restocked as necessary (look under the sink for restocking items).
4. Chemicals in hood are capped properly (for the entire laboratory period).
5. UV lamps & propane torch returned to pull out shelf
6. Micropipettes pulling area cleaned up

7. Solvent bottles are returned to the solvent cabinet
8. Aqueous solutions & Drying agents & acids are returned to the cabinet
9. All equipment stored properly:
  - a. Ring stands, heater/stirrers, aluminum blocks - one in each cabinet
  - b. Common glassware - clean and returned to the island glass racks
  - c. Water tubing – draining on the island glass racks
  - d. Mel-Temps - clean, returned to side shelves neatly arranged with the cord bundled up with velcro tie
10. All waste handled properly:
  - a. Liquid organic waste - organic waste jug in main hood (funnel lid must be shut at end of lab)
  - b. All other paper towels, gloves, and empty boxes - trashcan
  - c. Any specific lab wastes - recovery jar, as directed by lab manual

## Grading

**Notebook:** 30%. Assessment of the notebook is through the notebook quiz. See the lab manual for details, and sample notebook quizzes.

**Theory & Practice Test:** 30%. Sample tests can be found in the course pack. There is one test at the end of the semester.

**Postlab Assignments:** 30%. Specific details regarding the content of postlab assignments are given on Blackboard for each experiment. Postlab assignments vary in format and are tailored to suit the learning goals of each particular laboratory exercise. Late assignments are accepted only if the policy of your TA permits. **You may not submit pictures, chemical structures, illustrations or graphics copied from the web, or any other source.** The safety quiz is counted in this category (and not in the prelab quiz category).

**Lab Attendance:** 4%. You will be evaluated on attendance, whether the lab is kept clean, and adherence to safety protocol.

**Lab Clean Up Points:** 4%. See the previous section for an explanation of the clean up points, but the rule of thumb that if there is anything left at the end of lab that your TAs must clean up then you have lost point in this category.

**TA Grade:** 2%. Your TA will evaluate your general skill in solving the laboratory problem at hand. You should endeavor to prepare thoroughly, work independently, show consideration for others, and in general develop a worker-supervisor relationship of a professional nature. The TA will also evaluate your general laboratory technique (e.g., Do you need reminding that a TLC chamber should have a lid? Is your apparatus set up properly, securely and safely? Do you heed safety warnings and instructions regarding the use of chemicals? Do you spend laboratory time wisely?). Be prepared to explain what you are doing, and WHY you are doing it.

94-100	A
90-94	A-
86-90	B+
82-86	B
78-82	B-
74-78	C+
70-74	C
66-70	C-
62-66	D+
58-62	D
<58	F

**Summary Statement on Grading:** Students who attend all labs, submit all assignments, keep a decent notebook, and do reasonably well (passing) on the Theory and Practice test should expect to get some form of a B or higher. If necessary, scores will be scaled up to reflect this goal.