

Course Syllabus for Organic Chemistry Laboratory 1

CHEM 129A, Fall 2020

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Welcome to CHEM 129A, Organic Chemistry Laboratory! This course will introduce you to one of the richest and most beautiful areas of modern chemistry: *chemistry of carbon compounds*. In CHEM 129A, we will learn skills that are essential for performing experiments in organic chemistry laboratory.

Read the syllabus carefully. Almost all questions about the course that you might ask can be answered by referencing the syllabus. If you are uncertain that you understand all rules and regulations, please contact me. Also, the syllabus for my sections differs slightly from those used in other sections

Changelog

This syllabus and schedule are subject to change in the event of extenuating circumstances. If you are absent from class, it is your responsibility to check on announcements made while you were absent. Changes and corrections are listed in the changelog below and will be announced on Canvas.

- 2020-06-22: Draft created

General information

- **Course name and number:** CHEM 129A (2 Units)
- **Prerequisites:** CHEM 8 or CHEM 128A with a grade of C or better. CHEM 128A can be taken concurrently.
- **Contact¹:** Science 1 room 352, phone (559) 278-2711, hmuchalski@mail.fresnostate.edu
- **Office Hours:** TBA. Additional consultation appointments can be scheduled through calendar function "Find Appointments" on Canvas.

Course materials and technology

- **Textbook:** "A Micro-scale Approach to Organic Laboratory Techniques, 6th edition" by Donald Pavia et al. published by Thompson/Brooks Cole. Previous editions will also be sufficient to learn the material but page numbers as well as problems will be different.
- **Notebook:** Organic chemistry laboratory notebook from Hayden-McNeil, spiral-bound, (ISBN:9781930882461). General chemistry notebook (ISBN:978-1930882744) is also good alternative but will not have organic chemistry-specific reference materials on covers.
- **Personal protective equipment (PPE):** Lab coat and approved safety goggles. Disposable nitrile gloves will be provided.
- **Canvas:** The central repository for all course materials and information is our Canvas site, accessible through <https://fresnostate.instructure.com/courses/3782>. The Canvas site will house your grades, links to handouts, videos, and other materials.

¹Please note that I typically check email between 11 am and 4 pm, Monday through Friday. Usually, my response time is *within 12 hours of reading the message*. I strongly encourage you to use Canvas communication tools (Discussions) where you can ask questions to the entire class at any time, making it more likely to get a quick response.

Laboratory Code of Safe Practices

1. NO food or drink in the laboratory.
2. Wear clothing appropriate for laboratory work.
3. Select and correctly use appropriate Personal Protective Equipment (PPE).
4. Know what to do and who to contact in an emergency in the laboratory.
5. Avoid distractions and be alert to and aware of your surroundings and potential hazards in your area.
6. Maintain a safe and clean work area.
7. Only conduct experiments or procedures approved by your lab instructor or research advisor.
8. Understand the common chemical hazards and hazards specific to the chemicals and procedures with which you are working.
9. Understand and follow best practices on how to handle, transport, store, and dispose of chemicals safely.
10. If any equipment, glassware, or procedures are not working properly or as expected, notify your instructor before proceeding.
11. Notify your instructor if you have, develop, or may develop any medical conditions (e.g. severe asthma, limited mobility, vision impairment, pregnancy, etc) that may affect your safety in the laboratory or sensitivity to chemicals, so that your instructor can properly advise or accommodate you on minimizing the risks associated with laboratory work.

Full discussion of these principles can be found here: <https://goo.gl/1UFRbo>. For additional information about safety in undergraduate teaching labs please refer to *Guidelines for Chemical Laboratory Safety in Academic Institutions* published by American Chemical Society.

What is CHEM 129A

CHEM 129A is a two unit introductory laboratory course in organic chemistry. It is primarily concerned with introducing the tools and techniques that chemists use to synthesize and investigate the properties of organic compounds (see the [list below](#)). Some of these techniques are the same or similar to those you learned in general chemistry courses but may be modified because the experiments use very small amounts of material (micro-scale techniques).

Students who successfully complete CHEM 129A generally enroll in CHEM 129B, which further develops students' laboratory skills. Some students then continue with CHEM 190, undergraduate research or independent study.

Student Learning Outcomes

Students who successfully complete CHEM 129A should be able to:

- maintain an accurate laboratory notebook that would allow another properly trained person to reproduce the experimental work with the similar results;
- understand how to work safely in the laboratory, including the disposal of chemical wastes;
- find relevant information about reagents, equipment, and techniques;
- build apparatus for a reflux reaction;

- carry out basic organic techniques such as extraction, crystallization, distillation, and chromatography;
- measure physical properties of organic compounds including melting and boiling points;
- carry out liquid–liquid extraction; and
- analyze purity and chemical identity of organic compounds using TLC, GC, and IR.

Course requirements

In-lab requirements

Two 170-minute lab meetings per week (Monday and Wednesday) where we experimentally explore selected organic chemistry concepts (5.67 hours per week). Attendance is mandatory because you must complete all experiments to obtain a passing grade. Typically, the in-lab session will start with a short review of relevant material, concepts, and chemical safety through group discussions and problem-solving activities.

You will not be allowed to enter the lab if a) you are late and missed the pre-lab discussion; b) you are not appropriately dressed to work in the lab; or 3) you don't complete the pre-lab assignment.

If you cannot attend a lab you must notify your instructor and lab coordinator as soon as possible explaining why you have to miss the lab. Arranging make-ups is very difficult because every semester all lab sections are at full capacity. If your request is approved you are still required to document the reason for missing the lab, and will be expected to make the lab up and complete the assigned work. If the above conditions are not met, you will receive 0 for the missed lab.

Out-of-class requirements

I expect that you will come to lab with a basic understanding of the concepts that will allow you to fully participate in pre-lab discussions. Preparing for the lab means making honest effort to learn on your own. This is done by:

- reading the assigned textbook material related to the scheduled experiment;
- preparing the pre-lab assignment;
- reviewing the relevant techniques for each experiment (listed in the introduction section for each experiment);
- watching videos demonstrating laboratory techniques; and
- reviewing safety data sheets (SDS) for chemicals you will be working with.

Out-of-class work also includes analysis of data collected in the lab. For the first half of the semester this will take form of post-lab summary written in your notebook. Later in the semester the post-lab analysis will include a typewritten lab report. Total out-of-class workload is estimated at 8–12 hours per week.

Types of graded work

There are four kinds of graded work you will encounter in this course:

1. Laboratory notes (both pre-lab and in-lab notes)

2. Post-lab summaries and lab reports
3. Quizzes
4. Practicals

Laboratory notebook

Assume that you're in note-taking mode at all time when you are in the lab. Well prepared pre-lab and in-lab notes are very important because they are the basis for the post-lab summary or report that you will write for each set of experiments. Pre-lab notes are generated in preparation for the scheduled experiment. In-lab notes document what you did in the lab (including notes taken during lecture and discussions) as well as results of your experimental work. To know what to write and not to write in the notebook is a balancing act of relevance and brevity. You need only details that are relevant and necessary to reproduce the experiment. You can assume that your notes are going to be read by a trained organic chemist. For example, you don't have to explain what is a round-bottomed flask. Keep all prints (IR and NMR spectra, gas chromatograms, etc.) and sketches of TLC plates as part of your notes portfolio. Your lab notebook is subject to evaluation at any time and must be kept current. Instructions on how to keep laboratory notebook are discussed in the textbook and will be reviewed in the lab. You will submit copies of your pre-lab notes at the beginning of the lab and in-lab notes before you leave the lab room.

Post-lab summaries and reports

One of the main objectives of this course is for students to learn to interpret and communicate the meaning of experimental results. The post-lab summary or lab report is an assignment that shows the depth of your understanding of the concepts, techniques, and instrumentation used in the lab. For experiments in the first half of the semester you will write a short summary of results and conclusions in your notebook. All notebook pages will be graded as a whole (5% per lab).

Lab reports

Later in the semester, a typewritten report will be assigned as post-lab summary and reflection. There will be total of six (6) typewritten reports. Four regular experiments and two practicals. I will use a grading system that allows for revision and resubmission that gives you multiple attempts to demonstrate the level of learning you achieved. Lab reports will be evaluated using a rubric that classifies the work with marks of *Satisfactory* (S) *Progressing* (P), or *Incomplete* (I). Work marked as *Satisfactory* will receive full credit. Reports marked as *Incomplete* or *Progressing* can be revised and resubmitted before the grade becomes final. Each student can re-submit up to two reports (or one report twice) without point reduction. Additional revisions will be at a cost of point reduction. Details of the process of revision and resubmission will be discussed in class.

Quizzes

Quizzes test your understanding of the lab techniques and experiments you conducted and will be based on material covered in the pre-lab lectures, reading assignments, and experiments. Quizzes will be take-home assignments because they test higher order thinking skills which are rarely well performed under the pressure of time. The only quiz we will have in class is the *Safety Quiz*.

Safety Quiz. You must pass the Safety Quiz to remain in the class. You can take the quiz up to 3 times. The quiz is based upon the information on safety sheet, your instructor's lab lecture on safety, and Technique 1 (Safety) in the lab textbook. You must be familiar with the safety protocols, abide by the guidelines *at all time* to keep yourself, other lab occupants, and everyone else in the building safe.

Practicals

These are the last two experiments for the semester (see [Lab Schedule](#)). You will be given a procedure (handout) at the beginning of the Practical session and your grade for these Practical will be based on your skills and performance in the lab (yield and purity of your product) and your experimental write-up.

Final letter grade scheme

Grade brackets are imposed by course coordinator. In the past, the grading scale followed a pattern close to the following: A = 85–100, B 75–84, C 65–74; D 50–64; and F <50.

Grade component	% (each)	Subtotal
Experiments (10)	5%	50%
Practicals (2)	9%	18%
Quizzes (4)	8%	32%

Course policies

Technology issues when submitting work

For assignments submitted electronically, it is your responsibility to make sure they are submitted on time, through any means necessary, even if technology issues arise. If a tech issue arises, it is your responsibility to find another way to get it to me (for example, via an email attachment). Technology issues that are avoidable or resolved with a simple work-around will not be considered valid grounds for a deadline extension. For example, if you are trying to upload a Lab to Canvas and Canvas won't accept the file, you should try again later or send the file as an email attachment until you can upload it successfully.

Academic Dishonesty

For most assignments you are allowed and encouraged to work with others. However, the final product that you submit for feedback must be the result of your own efforts. Therefore you may share ideas and strategies with others, but collaboration on the actual finished product you submit is not allowed. Your work is expected to be the product of your own thinking, written and explained in your own words with no parts of the work copied from external sources such as books or websites, and done clearly enough in your own mind that you could explain the work from start to finish if asked. Specifically, this excludes:

- copying work from another student;
- copying work from a website;
- paraphrasing work done by another student or from print or internet resources—i.e. putting it in your own words—without coming up with the main ideas and strategies yourself; and
- *allowing or enabling* another student to copy or paraphrase work that you did, even if you did the original work yourself.

Violation of this policy is considered “academic dishonesty” and carries with it strong punitive measures mandated by Fresno State, including possible automatic failure of the course or suspension from the university. For details, please see APM 235 by going to <http://www.fresnostate.edu/aps/documents/apm/235.pdf>.

You may feel tempted to academic dishonesty at some point in the semester. The work can be difficult, and many of you are under a lot of stress. If you are considering academic dishonesty, please STOP, take a breath, and remember that your classmates and I want you to succeed in the course. You are not alone, and you have a strong network in the class for getting help. The revision and resubmission policies mean that it's OK to turn in work that isn't perfect. There is no need to be academically dishonest! Just do your best on the work, and you'll have the chance to revise it later.

Dropping the course after the census date

A *serious and compelling reason* is defined as an unexpected condition that is not present prior to enrollment in the course that unexpectedly arises and interferes with a student's ability to attend class meetings and/or complete course requirements. The reason must be acceptable to and verified by the instructor of record and the department chair. The condition must be stated in writing on the appropriate form. The student must provide documentation that substantiates the condition.

Failing or performing poorly in a class is not an acceptable “serious and compelling reason” within the University policy, nor is dissatisfaction with the subject matter, class or instructor.

University policies and disclaimers

In addition to course policies, you are expected to be familiar with Academic Regulations described in the [University Catalog](#) as well as policies listed below.

Students with Disabilities: Upon identifying themselves to the instructor and the university, students with disabilities will receive reasonable accommodation for learning and evaluation. For more information, contact Services to Students with Disabilities in the Henry Madden Library, Room 1202 (278-2811).

- Class Schedule Policies: <http://fresnostate.edu/studentaffairs/classschedule/policy/>
- Copyright Policy: <http://libguides.csufresno.edu/copyright>
- Students with Disabilities: <http://fresnostate.edu/studentaffairs/careers/students/interests/disabilities.html>
- Academic Integrity and Honor Code: <http://www.fresnostate.edu/academics/facultyaffairs/documents/apm/236.pdf>

- Policy on Cheating and Plagiarism: <http://fresnostate.edu/studentaffairs/studentconduct/policies/cheating-plagiarism.html>
- Add/Drop Course: <http://www.fresnostate.edu/studentaffairs/registrar/registration/>
- Computer requirements: <https://www.fresnostate.edu/catalog/academic-regulations/index.html#computerreq>
- Disruptive classroom behavior: <http://www.fresnostate.edu/academics/facultyaffairs/documents/apm/419.pdf>

University Services

- Associated Students, Inc.
- Dream Success Center
- Learning Center Information
- Student Health and Counseling Center
- Writing Center