

Course Syllabus: CHEM 129A (Organic Chemistry Lab I)

Hubert Muchalski, Ph.D.

Fall 2018

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.

Sec	Course	Time	Day	Bld	Rm	Instructor
05	75086	09:00A-11:50A	TuTh	S	370	Munshi K
07	74936	08:00A-10:50A	MW	S	370	Muchalski H
08	74937	09:00A-11:50A	MW	S	372	Chen M
10	75335	09:00A-11:50A	TuTh	S	372	Tamras S
12	75708	01:00P-03:50P	TuTh	S	370	Ciula J
16	75087	12:00P-02:50P	MW	S	370	Muchalski H
17	75692	01:00P-03:50P	MW	S	372	Tamras S
18	76133	01:00P-03:50P	TuTh	S	372	Tamras S

Changelog

The syllabus is a live document which is regularly updated. 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 Blackboard.

- 2018-08-23: Syllabus published on Blackboard

Logistics

- **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.
- **Class schedule:** <https://hmlab.page.link/129a-schedule> (Week = Sunday 12:00 am until Saturday 11:59 pm)
- **Instructor:** Hubert Muchalski, Ph.D., Assistant Professor of Chemistry
- **Instructor office:** Science 1 room 352
- **Office Phone:** (559) 278-2711
- **Email:** hmuchalski@mail.fresnostate.edu. I regularly check email between 11 am and 5 pm, Monday thru Friday. Usually, my response time is *within 6 hours of reading the message*.
- **Course coordinator:** Dr. Santanu Maitra (smaitra@csufresno.edu, office: S1-246; office hours: MW 12:30–1:30 pm)

Office hours and instructor availability

I will be available for in-office consultations Fridays 2–4 pm. Walk-in visits are welcome but appointments get first priority. If Friday doesn't fit your schedule, there are additional time slots throughout the week available for appointments. To sign up for an office hours appointment go to <https://muchalski.page.link/book>

Course materials and technology

- **Textbook:** “A Microscale 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.
- **Binder:** For holding your notebook pages and printed copies of collected data (IR, GC, NMR).
- **Personal protective equipment (PPE):** Lab coat and approved safety goggles. Disposable nitrile gloves will be provided.
- **Blackboard:** The central repository for all course materials and information is our Blackboard site, accessible through <https://blackboard.learn.fresnostate.edu>. The Blackboard site will house your grades, links to handouts, videos, and other materials; and other course tools. We will often use other tools such as Google Drive, but these are all linked to the Blackboard site, so keeping track of multiple websites is not necessary.
- **Mobile scanning app:** There are multiple mobile apps that can turn a picture of a page in to PDF. Make sure the app you're using allows you to upload scanned pages to Google Drive. Free (with ads) cross-platform app I can recommend is CamScanner.

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. ([Download free PDF copy](#))

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 (microscale 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 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:

- you are late and missed the pre-lab discussion,
- you are not appropriately dressed to work in the lab, or
- you don't complete the pre-lab assignment.

If you can not attend a lab meeting you must notify your instructor before the lab period begins. If you encounter and document a true emergency, I will make reasonable arrangements for you to make-up the lab and complete the assigned work. If the above conditions are not met, then a grade of 0 will be given 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 by:

- reading the textbook material related to the scheduled experiment;
- preparing the pre-lab write-up;
- 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. (8–12 hours per week)

Types of graded work

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

- Laboratory notes (both pre-lab and in-lab notes);
- Post-lab summaries and lab reports
- Quizzes; and
- Practicals.

Laboratory notes

I will provide a template paper for you to write your notes. No need to buy additional notebook. You will submit your notebook pages electronically. At the end of each experiment set I will grade them and give you feedback.

Pre-lab notes contain answers to questions as well as documentation related to the planned experiment which you will prepare before carrying out scheduled experiments. In-lab notes document what you did in the lab (including notes taken during discussions) as well as results of your experimental work.

Assume that you're in note-taking mode at all time when you're 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. 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.

Instructions for maintaining your laboratory notebook are in the textbook and will be discussed in the lab. Include all printouts (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.

Post-lab summaries and reports

One of the main objectives of this course is for you 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. 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 reports on scheduled experiments and two on results of practicals (see [the schedule](#) for details).

To grade the typewritten reports I will use a grading system of revision of your work 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). Points are not involved in grading reports. Work marked as *Satisfactory* will receive full credit. Reports marked as *Incomplete* or *Progressing* can be revised and resubmitted before the grade becomes final. If a resubmitted report meets criteria for *Satisfactory* grade, full credit will be awarded. Deadlines and conditions for submission of revised reports will be communicated via Blackboard.

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 are strongly encouraged to read the safety related notes, abide by the guidelines ALL THE TIME to keep the lab, lab occupants, and everyone else in the department 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.

How your course grade is determined

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)	7%	14%
Quizzes (4)	8%	32%
Evaluation	4%	4%

Expectations

Expectation for students

I want you to be successful in this course. I will do my utmost to help you do this, by creating and maintaining a learning environment based on challenge and support and giving my highest professional commitment to your success and well-being. But, **I cannot achieve success for you.** Success in college courses comes from cooperation with instructors, interaction with your classmates, and diligent effort throughout the semester. I like to compare successful classroom interactions to interactions between players and coaches on a sports team. Players do the work and coaches make sure players do the work that helps players succeed.

Expectations for professor

My primary responsibility is to create a learning environment where it's safe to take risks and make mistakes, without shaming or judgment, and to give you feedback and guidance as you grow in your understanding of the subject. As my students, you have a right to expect from me:

- carefully designed and executed learning activities both in and out of class;
- informative feedback on, and timely return of all graded work (I strive to return all graded work within one week of your turning it in);
- timely responses to all communications; and
- respectful, professional treatment in all personal interactions.

If you perceive that I am falling short in any of these expectations, you have the right and responsibility to give constructive feedback that helps me improve. I will consider all reasonable suggestions in the course regarding my instruction or the course design.

Course policies

Technology issues when submitting work

Copies of lab notebook pages are submitted electronically. It is the student's responsibility to make sure these items are submitted on time, through any means necessary, even if technology issues arise. If a tech issue arises that prevents your being able to submit work on time, 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 Blackboard and Blackboard 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 Integrity

For most other 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

Students may drop classes using the on-line system through Thursday, September 13. The Drop/Withdrawal Form, signed by instructor and department chair, is needed to drop a course after that date. Withdrawals processed before 9/20 will not show on the official transcript. Serious and compelling drop period begins on September 21 and ends on November 20. More details on [Admissions web pages](#)

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 <http://www.fresnostate.edu/catalog/academic-regulations/> as well as policies listed below.

- Copyright Policy
<http://libguides.csufresno.edu/copyright>
- Academic Integrity
<http://fresnostate.edu/studentaffairs/studentconduct/academic-integrity/>
- Policy on Cheating and Plagiarism
<http://fresnostate.edu/studentaffairs/studentconduct/policies/cheating-plagiarism.html>
- Students with Dissabilities
<http://fresnostate.edu/studentaffairs/careers/students/interests/disabilities.html>
- Add/Drop Course
<http://fresnostate.edu/studentaffairs/classschedule/registration/add-drop.html>
- Policy on Disruptive Classroom Behavior
<http://www.fresnostate.edu/academics/facultyaffairs/documents/apm/419.pdf>

Appendix A: Grading rubric

Lab reports assignments are graded either Satisfactory (S), Progressing (P), or Incomplete (I). The base criteria for all reports are as follows (some reports may have additional criteria which will be explained withing the assignment):

- **Satisfactory (S):** Understanding of the concepts is evident, although there may be a small number of mistakes in the work that do not significantly affect the overall reasoning. Answers to all questions and prompts are backed up by work that is clearly shown and easy to read.
- **Progressing (P):** Partial understanding of concepts is evident, and all parts of the solution have a good-faith attempt. But there are significant errors in computation, logic, or writing that affect the overall reasoning. The work should be revised.
- **Incomplete (I):** No work submitted or there are significant omissions in the work, such as parts of the solution left blank intentionally or essential parts of the reasoning behind the answers that are missing or unreadable. Not enough information to determine if the concepts are fully understood.