

Chemistry 114 Advanced Organic Chemistry (Sec 1 & 2) Fall 2019

Contact Information

Instructor:	Roy K. Okuda, PhD
Office Location:	Duncan Hall 9A (basement)
Telephone:	(408) (924-2525)
Email:	roy.okuda@sjsu.edu
Office Hours:	Tues 3:00 to 4:30pm; Wed 10:30am to Noon
Class Days/Time:	Lab: MW 2:30-5:20; Seminar W 1:30-2:20
Classroom:	Science 139
Prerequisites:	Completed Chem 55, Chem 100W, 112B and Chem 113B with grade of "C" or better (and appropriate prerequisites for these courses)

Faculty Web Page and MYSJSU Messaging

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on the Canvas page for this course. I will also use the email address listed on your mySJSU account regularly to send information on Chem 114 - make sure your email is current. You are responsible for checking for messages on this email on a regular basis to learn of any updates. Many important files will be posted to Canvas, so be sure you check it frequently. If you are unable to access Canvas, let me know and I will refer you to the Canvas help desk.

Course Description

Chem 114 Advanced Organic Chemistry is intended to provide you with experience in more advanced procedures over what you learned in Chem 113A and 113B. It is particularly designed to give you greater familiarity with the manipulation, synthesis, and analysis of organic compounds, and to give you some exposure to research in this area of chemistry. As a "Capstone" course in Chemistry, Chem 114 is designed to encourage you to apply your basic knowledge in chemistry to solve experimental problems and to design solutions. In some cases, you will be given only general instructions, and you will have to decide how to proceed and to troubleshoot situations with relatively little input

from the instructor. In addition, oral and written communication skills will be stressed in Chem 114.

Course Goals and Learning Objectives

Course Learning Outcomes (CLO)

- identify unknown organic compounds using a combination of physical methods (including melting point, solubility), qualitative chemical tests, and spectroscopy (including mass spectrometry, infrared spectrometry, 1D and 2D proton and carbon NMR spectroscopy); be able to do this proficiently both by paper exercises and in lab work.
- be able to determine how to successfully separate and purify an unknown binary mixture of organic compounds
- perform literature research to design an independent research project which can be conducted within the time and infrastructure framework of the course and facilities.
- write a protocol for a research project, including safety issues (review MSDS for all chemicals involved)
- conduct research in a safe and responsible manner
- perform the experimental protocol in lab, be able to troubleshoot when problems arise and devise "workarounds"
- keep an up to date laboratory notebook
- write formal written reports in the form of a manuscript (using the format of a *Journal of Organic Chemistry* manuscript)
- prepare and present an oral presentation (using Powerpoint) in a formal symposium setting.

Program Learning Outcomes (PLO)

Chemistry 114 satisfies the following Program Learning Outcomes for the Chemistry Department:

PLO #2 - Demonstrate understanding of core concepts and to effectively solve problems in organic chemistry.

PLO #6 - Answer questions regarding safe practices in the laboratory and chemical safety.

PLO #7 - Demonstrate safe laboratory skills (including proper handling of materials and chemical waste) for particular laboratory experiments.

PLO #9 - Effectively present a scientific paper orally, as per at an American Chemical Society symposium.

PLO #10 - Write a formal scientific laboratory report, using the format and style of an article in a peer-reviewed American Chemical Society journal

Required Texts/Readings

Textbooks (you may already have these textbooks from Chem 113B).

IMPORTANT! You must have printed (paper) copies of these textbooks. You are allowed to use them during quizzes and exams, but computers and eBook versions are not allowed.

Silverstein, R.M., Webster, F.X., Kiemle, D.J. *Spectrometric Identification of Organic Compounds, 7th edition*, 2005 (ISBN 0-471-39362-2)

Pavia, D.L., Lampman, G.M., Kriz, G.S., Vyvyan, J.R. *Introduction to Spectroscopy, 4th or 5th editions are acceptable. However, you should have the "full" version of the book (not the shortened SJSU edition).*

Other Readings

-American Chemical Society (ACS) Style Guide

-McMurry, John, Organic Chemistry, or any recent organic chemistry textbook

Other equipment / material requirements

-Scientific laboratory notebook with duplicate numbered pages (the Chemistry Club sells a version)

-basic calculator which does not connect to the internet.

-pencils, rulers

Library Liaison

The Chemistry Library Liaison is Yen Tran (yen.tran@sjsu.edu)

Course Requirements and Assignments

Catalog Description: A capstone course on special topics in laboratory experiments utilizing modern chemical, physical and spectrometric methods. A grade of "C" or better is required for majors. Prerequisite: CHEM 055, CHEM 100W, CHEM 112B and CHEM 113B (with grades of "C" or better; "C-" not accepted). Misc/Lab: Lecture 1 hour/lab 6 hours.

Chem 114 involves 2 main Sections. Section 1 will consist of two unknowns (one will be pure, and the other a binary mixture), and you will be expected to identify the individual components (after separation, if necessary) using spectroscopic techniques. This section is also intended to give you a chance to re-familiarize yourself with the lab equipment and bench techniques, as well as with spectroscopic techniques you have already seen in Chem 113A and 113B. Section 2 will be more "free form" and will entail a short-term "Mini-project." While you are working on your unknowns, you will research a topic of interest to you, and develop a protocol to perform the project in class. At the end of the semester, you will present the results of this project orally during one of the last lab meetings. The presentations will be done in the format of an American Chemical Society "symposium" and you will give your talk using PowerPoint. Both sections also include progress reports or proposals, and a written formal report.

Since this is the third semester of organic labs, from the outset you will be expected to have a good understanding of the following forms of spectroscopy that we covered in Chem 113A and 113B: ^1H and ^{13}C NMR, COSY 2D NMR, IR, and mass spectrometry. You should immediately begin to review the appropriate sections of your textbooks, since you will use these methods in lab from the very start of the semester. Although we will be reviewing these techniques in the Wed 1:30pm lectures during the next 15 weeks, you

will be applying most of these techniques from the very beginning. You should note that the scheduled lecture on Wednesday will only give a brief overview of each spectroscopic method, and will not emphasize problem solving using that method. You will be expected to work problems on your own, including from the textbooks, problem sets and online resources.

It is also assumed that you are familiar with basic laboratory techniques, such as extraction, distillation, GC, TLC and column chromatography, reflux, recrystallization and other techniques which were covered in both Chem 113A and 113B. You may wish to re-acquaint yourself with the appropriate section in the SJSU Chem 113A website, which has photos and videos of nearly every method we will use.

<http://www.chemistry.sjsu.edu/straus/visioche.htm>

If you did not take Chem 113A and 113B at SJSU and have little or no actual experience with these techniques, you should not take Chem 114, but should take either Chem 113A or 113B, depending on your prior experience. Other techniques and instruments will be introduced during this course. The two essential prerequisites for this course are both **Chem 100W and Chem 113B (may not be taken concurrently)**. **You may not enroll in Chem 114 if you have not completed both of these courses with a grade of "C" or better.**

Tentative Course Calendar:

August 21	Introduction, greensheet, schedule, safety, check-in
Aug 26 to Sept 25	Exp. 1 Qualitative Organic Analysis - single and binary unknowns
Sept 30 to Nov 25	Exp. 2 Mini Research Project
Oct 8	Formal Report for Exp. 1 due.
Dec 2 & 4	Chem 114 Symposium - oral reports on Mini Project
Dec 9	Check out
Dec 13 Fri	Final Exam (12:15 to 2:30pm); Formal Report for Exp 2 due.

This is a tentative schedule and is subject to modification (except for the Final Exam and due date for Exp. 2). See the end of this document for a more detailed schedule.

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. **More details about student workload can be found in [University Policy S12-3](http://www.sjsu.edu/senate/docs/S12-3.pdf) at <http://www.sjsu.edu/senate/docs/S12-3.pdf>.**

NOTE that University policy F69-24, "Students should attend all meetings of their classes, not only because they are responsible for material discussed therein, but because active participation is frequently essential to insure maximum benefit for all members of the class. Attendance per se shall not be used as a criterion for grading."

Also, "Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/studying, or course related activities,

including but not limited to internships, labs, and clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.”

Attendance Policy / Lab Makeup

Attendance is mandatory for ALL class and lab meetings. You should plan to attend all lab meetings and to use the time to make meaningful progress. You should not "skip" labs for any reason (e.g. to study for an exam for another course, personal travel or other reasons). Missing labs will cause you to fall behind and options for makeup are limited (see below). Keeping on time with the schedule requires a significant amount of preparation before each lab meeting.

At the end of each lab period, you must ask me to countersign your notebook pages for that day. These signatures will be checked as I grade reports, and each lab day must show a signature by me. You must remember to ask for my signature, I will not sign notebooks retroactively. Each signature will result in +1 point added to your point totals for Chem 114! (from Aug 27 to Dec 3) Lab starts at 2:30pm and ends at 5:20pm – to get my signature you must be working in the lab the entire period. I won't sign if you leave early or are only present for part of the lab period.

Since this is the only section of Chem 114, options for makeup labs are limited. If you miss a lab for an unexpected reason, such as a medical problem, provide a verifiable document to explain the circumstances. Depending on the circumstances, an accommodation may be determined. It is extremely important to note that under no circumstances are you to perform any lab work related to Chem 114 outside the lab time (see Safety below).

Grading Policy

GRADING (see below for numerical breakdown and percentages)

Each of the two **experiments** will be worth a maximum of 80 points. Of this, 10pts will be assigned to the progress report or proposal, and 70pts for the formal report (including the lab notebook, product, and spectral assignments). Lab notebooks must be presented at the end of each lab day before you leave to be "countersigned" by the instructor. If not signed off, 1 point will be deducted from the report grade for each day without a signature. Information on lab notebooks and formal report are provided below.

A total of 6 **quizzes** will be given during the semester. Five of these quiz scores will be counted to your grade. You may either: A) take all 6, with the lowest grade dropped, or B) take 5 quizzes, and all 5 will count toward your grade (a quiz not taken for any reason will be the score not counted). In general, makeup quizzes will only be provided in unusual circumstances (i.e. medical emergencies that cause you to miss more than one quiz). Note that the SIXTH quiz (see Schedule) will be worth "double points" (40pts) and will involve advanced spectroscopic methods for structure analysis (if you take this quiz, it is possible to have >100pts for the quizzes).

All quizzes and exams are open notes and open book (only for the course textbooks). You are **required to bring your OWN books for the exams**. Sharing of books during tests is not allowed.

The **final exam** will be comprehensive, and will include elements of the lab experiments and the spectroscopy lectures, as well as questions related to working in an organic chemistry laboratory.

The **oral presentations** will be given in lab on Dec 5. Each student will present an oral presentation of the project s/he had chosen for the second experiment. Your presentations will be given in the style of "short-talks" such as may be seen in an ACS Symposium. Additional details will be given later in the semester.

Note that the final 114 grade is based on a *conglomerate* of the individual graded items (each item is not assigned a "grade"). So, if you have a somewhat low point total on one item, you can make it up with a better point total of another graded item.

Grading (continued):

The course grade will assigned as "plus/minus" and will be based on the following categories:

Experiment formal reports	2 x	80pts each	=	160pts (40%)
Quizzes (drop 1)	5 x	20pts each	=	100pts (25%)
Final exam			=	100pts (25%)
Oral presentation			=	40pts (10%)
				400pts possible

+ notebook signatures

The course grade will generally follow the following correlations:

A+ = 100-97%	A = 96-93%	A- = 92-90%
B+ = 89-87%	B = 86-83%	B- = 82-80%
C+ = 79-77%	C = 76-73%	C- = 72-70%
D+ = 69-67%	D = 66-63%	D- = 62-60%
F = 59-0% Unsatisfactory		

Any missed deadline for a report will be assessed a penalty of up to 1 point per day past the due date (weekend days will count!). Late reports for Experiment 1 will be accepted only up until graded reports are returned to the class. The formal report for Experiment 2 must be received by the date shown on your schedule (no reports accepted after the final exam is given). Use the attached schedule to plan your time accordingly, and preparation for the lab will help you immensely. All formal reports are **mandatory**: for each formal report not turned in, 10 points will be deducted from the total points accumulated for the semester.

In order to estimate your current grade in this course and progress towards your course grade, keep track of scores for all graded assignments (quizzes, lab reports) as the semester progresses. Add the points you obtained and divide by the total points scored up until that time to determine your % of points to that date. Compare the % to the table

to estimate your current grade standing. Bear in mind that the final course grade is based on multiple components so you have different opportunities to make up a low score.

When reports are returned to you, you will find written comments on them and a rubric that shows a breakdown of points for each section of the report. Review these carefully since they not only provide feedback on that report, but are intended to guide you for future reports. Use this information to assess your progress in this course.

For security, final course grades are not posted, sent by email, or given over the phone. If you would like a breakdown of your 114 scores, leave a stamped and addressed envelope with me at the final exam.

For upper division courses (R, S, V) include the following statements:

“A minimum aggregate GPA of 2.0 SJSU Studies (R, S, & V) shall be required of all students as a graduation requirement.” To see full text, review [University Policy S11-3](http://www.sjsu.edu/senate/docs/S11-3.pdf) at <http://www.sjsu.edu/senate/docs/S11-3.pdf>.

Equipment

You will be assigned an individual locker of equipment for your use during this course. You will be checked into your locker during the first lab period by the instructor, and sign an acknowledgement that you have all of your equipment. You are responsible for keeping track of all of the contents of your drawer. If you lose or break any item, you will be assessed a replacement fee at the end of the semester, so be careful with your equipment. It is possible to complete this course with a relatively small bill for expendable items: it is also possible to end up with a >\$100 bill. At the end of each lab period, make sure you have collected all your locker items before leaving.

When you check in, you will be given a coded check out pad from the storeroom. You may use this pad to check out additional equipment from the storeroom which may be required for a particular experiment. **Note that certain equipment items checked out must be returned the same day to avoid a late fee.** Remember, the code on your pad is assigned to you only, don't lose it, or someone else can check out items which will be charged to you. The Service Center will give you a document detailing their policies - read these carefully and make sure you understand the rules.

At the end of the semester, you must clean out your locker, replace all broken equipment or glassware, and have the instructor sign the check-out form. If this process is not completed fully, you may be charged a fee to clean and refurbish your locker. (also, if you drop the class, you must checkout no later than December 9 to avoid this fee)

Classroom Protocols for Chem 114

Schedule and Preparation of Experiments:

Experiments and due dates are given in the detailed schedule at the end of this greensheet. Note that the lab report and all supplementary material are due at the beginning of the lab period for the specific "due date." A detailed prelab lecture about each experiment will be given on or before the "begin" date of each experiment. In addition, supplemental

lectures may be given as needed. The Schedule is subject to change and changes will be announced in class.

Each of you will be performing a novel experiment for the Mini Project. This is very different from the experiments in Chem 113A and 113B, where everyone in the class works on the same lab simultaneously. As you will find, preparing for a completely novel experimental protocol requires a great deal of preparation and detail. This must be done, not only to ensure that your experiment proceeds smoothly, but also to be aware of any safety issues involved. As a result, no one will be allowed to start work on their Mini Project until I am satisfied that all aspects of the experiment have been described and documented. Most of this background work should be done outside of class before the start date of the Mini Projects.

A major requirement for success in Chem 114 is advanced preparation. This means you should read the experimental background and procedures carefully before the lab period. Note that you MUST have your preliminary writeup and table of reagents and products completed BEFORE you will be given any starting material. Obviously, if you have to work on these items during the scheduled lab period, you will seriously deprive yourself of adequate bench time to complete the experiment. Time is limited, so use each lab period efficiently.

Lab Notebooks:

As stated above, lab notebooks will be a component of your grade. They must be kept up to date on a daily basis with details of your results and progress.

The preliminary write-up of all notes and observations must be kept in a bound notebook that has pre-numbered duplicate pages. All entries must be made in pen - NEVER erase or use "white out"! **RECORD ALL OF YOUR NOTES AND OBSERVATIONS DIRECTLY INTO THE NOTEBOOK, AND AS THEY OCCUR.** In other words, don't write down numbers on scraps of paper and transfer them later, or try to memorize your measurements. The main purpose of the notebook is to be a daily "journal" for your laboratory activities to which you, or someone else, can read at a later date, and fully understand what you did, how you did it, and why the results came out the way they did. It's OK to scratch out entries - the main point is that it is organized and understandable.

As you'll learn, in professional situations the lab notebook is considered a legal document, and there are rules about how they are prepared and maintained. A typical practice is to have the notebook "countersigned" at the end of each lab day by someone else. For Chem 114, I will countersign all notebooks - this means you must show me your notebook before you leave each day to review and sign. If you miss getting my signature, in the report grade, one point per missing signature will be deducted.

Lab Reports:

This general guide describes many of the points involved in writing a concise and proper lab report. The Formal Report must be in the style of a Journal of Organic Chemistry ("JOC") article - see the ACS style guide, and any issue of JOC for details. The report must be typewritten or prepared by word processor, and double spaced. In addition to the formal report, for each experiment you must turn in:

- 1) a completed Report Summary Sheet
- 2) the carbon copy pages from your lab notebook,

- 3) appropriate labeled and interpreted spectra, and
- 4) the reaction product(s) - see below.

As with a published paper, the formal lab report should be written so that someone with a basic understanding of organic chemistry will be able to understand your experimental procedure, results and conclusions, and be able to reproduce your experiment. In your discussion, pay particular attention to the key discussion points listed in the experimental handout provided. The written report must be original, in your own words, and properly referenced. Under no circumstances may any part of a report which has previously been turned in for a Chemistry 114 student be used in your report. All rules of academic integrity (see below) will be enforced.

The formal reports for Chem 114 should be provided in printed form and (if requested) in electronic form. It is required that your report **MUST BE WRITTEN IN YOUR OWN WORDS**. Any report found with excessive amount of overlap from any other source will receive a grade of "0" (zero). See the section on Academic Integrity below.

Please turn in your printed report in a reusable envelope or folder, with each section (1, 2, 3 and 4) kept separate. You may staple or paper clip the pages within each section - please don't staple all your pages into one large document. Put your name on at least the first page of each section.

Products:

Where requested, your products should be submitted in clean vials that have labels with the following information:

Your name	Name of Compound
Weight (in g)	Mp or Bp (as measured by you)

Depending on the product, these will be graded on the basis of one or more of the following criteria: yield, melting / boiling point, appearance. Products must be turned in at the same time as your report.

SAFETY

Before beginning any lab work, the following items must be completed:

- 1) Attend the Safety Lecture
- 2) Read and sign the statement on Chemical Safety for Chemistry Labs
http://www.sjsu.edu/chemistry/docs/Safety_Sheet_IIc.pdf
- 3) View the Chemistry Safety film and sign the viewing voucher
- 4) Take the Lab Safety Quiz and obtain a score of 80% or better; retake the quiz if score is <80%.

All of the above conditions are required, and must be completed before you will be allowed to work in the lab!

In addition to the points covered above, the following rules are emphasized in this lab:

1. AS SOON AS ONE PERSON BEGINS WORK IN THE LAB, YOU MUST ALWAYS WEAR SAFETY GOGGLES, EVEN IF YOU ARE NOT DOING ANY

WORK YOURSELF!!! (over your eyes, not on your forehead!) If you see a fellow student not wearing eye protection, you are obligated to remind them to protect their eyes.

2. Be aware that we will be using some flammable solvents, do not have **any** flames when you (or someone else in the room) are handling these

3. Similarly, treat all acids, bases, and reagents as potential hazards. Avoid skin contact with all of these, and treat any contact immediately. If you have a spill, never leave it unattended (let the instructor know).

4. Dispose of all glassware in the special bins, not in the trash cans! This includes broken glass, as well as expendable items such as pipettes and melting point capillaries.

5. The texts have sidebars or highlighted sections outlining special safety precautions - always enter these into your procedure section in your notebook (another reason to read ahead!)

6. You are absolutely required to follow any instructions provided by the instructor related to procedures and/or safety. Failure to do so will result in your grade or result in immediate disenrollment from this class (see statement below).

7. Everyone working in the lab is expected to conduct yourself in a professional manner; no horseplay or unsafe actions are allowed.

8. If you are not sure, ask!!

Failure to comply with proper procedures and prescribed safety cautions shall subject the student to disciplinary action. 1) Any student who engages in unauthorized experimentation, or who seriously disregards safety, thereby endangering self or others shall be withdrawn immediately from the class with a grade of F. 2) Any student who shows persistent disregard for safety may have his/her grade lowered, and may risk being withdrawn with a final grade of F."

Special rules of safety and conduct apply when using the Varian Mercury 300 NMR and the HP MS and other instruments. These will be provided by the instructor.

With preparation and organization, it is possible to complete all of your lab work during the scheduled lab period. In general, no lab work will be permitted outside of the scheduled lab times. Usually, the only situation where this may be allowed is in cases of illness where more than a few periods are missed and for which you provide verification by your doctor. However, if you miss more than a few lab periods during the semester, it may be difficult to complete the course, since there is no other section of Chem 114 where you can perform makeup work (making up lab work in different lab courses is not allowed). In any case, under NO circumstances are you to perform any laboratory work for 114 outside of the scheduled lab time. Any student found performing unauthorized lab work for 114 may be disenrolled from the class.

Visitors: No visitors are allowed in the lab at any time. If someone needs to see you during a lab, they must wait outside the lab.

Cell Phone/computer usage: Cell phones may not be used in the lab, they must be turned off and put away. Computers/tablets may only be used for purposes related to Chem 114. While working in the lab, distractions while working must be kept to a minimum - this includes music and watching videos.

Chemical Safety (CHEM 120S)

Chemistry 120S (Chemical Safety) is a required course for all chemistry majors and minors, and a prerequisite for all students involved in Chemistry 180 or 298 research courses.

Academic Integrity:

No form of cheating, copying, or other unfair advantage will be tolerated, and will be dealt with severely. A first infraction will result in “0 points” for that experiment or exam. A second will result in an automatic grade of "F" for the course. The underlying principle will be fairness to all students in the course. In particular, copying or **plagiarism** (the excessive use of someone else's words, even if acknowledged, see the section from the Academic Senate below) is considered a serious offense, especially with regard to the formal lab reports. Note that simply "re-ordering" words from another source does not constitute an original paper. You must use your own words and analysis in all reports for this course. I may require that reports for this course be also submitted to Canvas Assignments, where they will be reviewed for originality by turnitin.com Instructions will be provided at the appropriate time.

Additionally, when you work on and turn in a report, it is expected that the work is your own only. While you may get general advice from your classmates and faculty members, you may not ask others to analyze your data for you. This includes faculty members at SJSU or other colleges/universities, trained professionals in the field, or any commercial services.

From the Office of Student Conduct and Ethical Development: “Your own commitment to learning, as evidenced by your enrollment at San Jose State University, and the University’s Academic integrity Policy requires you to be honest in your academic course work. Faculty are required to report all infractions to the Office of Student Conduct and Ethical Development. The policy on academic integrity can be found here:

http://www.sjsu.edu/studentconduct/Students/Student_Academic_Integrity_Process/

From the SJSU Academic Senate Resolution S04-12

1.2 PLAGIARISM:

At SJSU **plagiarism** is the act of representing the work of another as one's own (without giving appropriate credit) regardless of how that work was obtained, and submitting it to fulfill academic requirements. Plagiarism at SJSU includes but is not limited to:

1.2.1 The act of incorporating the ideas, words, sentences, paragraphs, or parts thereof, or the specific substance of another's work, without giving appropriate credit, and representing the product as one's own work; and

1.2.2 Representing another's artistic/scholarly works such as musical compositions, computer programs, photographs, paintings, drawings, sculptures or similar works as one's own.

BE SURE YOU UNDERSTAND WHAT PLAGIARISM MEANS. IF NOT, ASK!

University Policies

University Policies (Required)

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' [Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/> **Make sure to review these university and resources.**

The topics include the following:

[General Expectations, Rights and Responsibilities of the Student](#)
[Dropping and Adding](#)
[Consent for Recording of Class and Public Sharing of Instructor Material](#)
[Academic integrity](#)
[Campus Policy in Compliance with the American Disabilities Act](#)
[Student Technology Resources](#)
[SJSU Peer Connections](#)
[SJSU Writing Center](#)
[SJSU Counseling and Psychological Services](#)

Chemistry 114 Advanced Organic Chemistry (Sec 1) Fall 2019

NOTE THERE ARE TWO DIFFERENT CALENDARS BELOW!!

This is a tentative GENERAL schedule for the semester. Any changes will be announced in class.

Quiz and Due Dates are bolded

Weekly Laboratory Schedule

Week	Date	Topics, Readings, Assignments, Deadlines
1	8/21	Introduction, greensheets, schedule, policies; safety lecture; check-in
2	8/26 & 28	Qualitative Organic Analysis - single unknown; discuss Mini Project
3	9/4 (9/2 Labor Day)	Qualitative Organic Analysis - single unknown (cont.)

4	9/9 & 11	Qualitative Organic Analysis - binary unknown 9/11 @1:30 Spectroscopy Quiz 1
5	9/16 & 18	Qualitative Organic Analysis - binary unknown (cont.)
6	9/23 & 25	Qualitative Organic Analysis - binary unknown (cont.)
7	9/30 & 10/2	10/2 begin work on Mini-Project 10/2 @1:30 Spectroscopy Quiz 2
8	10/7 & 10/9	Mini-Project Research 10/8 Formal Report for Exp 1 due
9	10/14 & 16	Mini-Project Research 10/16 @1:30 Spectroscopy Quiz 2
10	10/21 & 23	Mini-Project Research
11	10/28 & 30	Mini-Project Research
12	11/4 & 6	Mini-Project Research 11/6 @1:30 Spectroscopy Quiz 4
13	11/13 (11/11 Veterans Day)	Mini-Project Research
14	11/18 & 20	Mini-Project Research 11/20 @ 1:30 Spectroscopy Quiz 5
15	11/25 (11/27 Thanksgiving)	Mini-Project Research – <u>Last Day for project research</u>
16	12/2 & 4	12/5 Chem 114 Research Symposium 12/4 @ 1:30 Spectroscopy Quiz 6 ("double point" quiz @ 40pts).
17	12/ 9	Check Out (everyone must check out on this day!)
Final Exam	12/13	12:15 to 2:30pm in Science 139 (or designated room); Formal Report for Exp 2 Miniproject DUE (no reports accepted after the final is over).

See below for the lecture readings and spectroscopy quiz schedule

**Chem 113B / 114
Weekly Wed 1:30pm Lecture Readings & Spectroscopy Quiz
Schedule
Fall 2019**

Date	Topic	
Aug 28	Intro to structure determination; Review of IR spectroscopy	Silverstein – Ch 2 (all) Pavia – IR chapter (all)
Sept 4	Carbon-13 NMR	Pavia – Ch 6, 9.4-9.5; <i>Ch 5.1-5.6, 5.8, 5.10-5.12 (review)</i> Silverstein – Ch 4; <i>Ch 3.1-3.4, 3.8-3.9 (review)</i>
Sept 11	Spectroscopy Quiz 1	
Sept 18	Proton NMR I	Pavia - <i>Ch 5.1-5.6, 5.8, 5.10-5.12, 5.19 (review)</i> Silverstein - <i>Ch 3.1-3.4, 3.8-3.9 (review)</i>
Sept 25	Proton NMR II	Pavia – Ch 5.9, 5.13-5.18, 5,20; Ch 7 Silverstein – Ch 3.5, 3.12-3.14, 3.16
Oct 2	Spectroscopy Quiz 2	
Oct 9	2D NMR	Pavia – Ch 9.7 Silverstein – 5.1-5.4, 5.4.3-5.4.5, 5.8-5.8.1, 5.10-5.10.1
Oct 16	Spectroscopy Quiz 3	
Oct 23	Mass Spectrometry I	Pavia Ch 8.1-8.7 Silverstein Ch 1.1 to 1.5.2
Oct 30	Mass Spectrometry II	Pavia Ch 8.1-8.7 Silverstein Ch 1.5.3
Nov 6	Spectroscopy Quiz 4	
Nov 13	Mass Spectrometry III / problems	Pavia – Ch 8.8 (all) Silverstein – Ch 1.5.4 to 1.6.17
Nov 20	Spectroscopy Quiz 5	
(Nov 27	Non-Instructional Day) – no class/lab	
Dec 4	Spectroscopy Quiz 6	
Dec 13	Final Exam 12:15pm – 2:30pm	

Pavia – 5th ed

Silverstein – 8th ed.

If time permits, additional topics may be included.

Problems in these books are not assigned, but you are encouraged to work on them to get additional practice! Additional problems will be provided in lecture and will be posted in Canvas Files. Also, ANY organic chemistry textbook will have basic spectroscopy questions for you to get more practice.