

CHEM V12BL: Organic Chemistry II Laboratory (CRN: 30485), Spring 2020

Essential Course Information

Class Meetings: MW 2:30pm-5:20pm in SCI-216

Course Units: 2.0 (6 hours of lab + 2-8 hours outside of class per week)

Prerequisites: CHEM V12A/V12AL with grades of C or better, CHEM V12B (Organic Chemistry II) or concurrent enrollment

Course Description: This course is designed to work with its lecture component, CHEM V12A, to cover the utilization of the techniques of experimental organic chemistry including physical and chemical methods of purification, separation, and structure determination, with an emphasis on syntheses and mechanisms. Infrared spectroscopy and nuclear magnetic resonance are used extensively in this course.

Who should take this course? This course, when combined with ChemV12BL, is a comprehensive study of all the major laboratory techniques in synthetic organic chemistry. The purpose of this course is to prepare students for laboratory work in scientific fields with the core chemical skills in lab as well as preparation of data and publishable lab reports. This course is required for many chemistry, biology, and health care fields. This course is a very large time commitment—be prepared to give it your all and take advantage of the many resources available to help you succeed!

About the Instructor

Instructor: Malia Rose-Seisa (preferred: Malia or Professor Rose)

E-mail/iMessage: mrose1@vcccd.edu (preferred, will usually reply within 24 hours)

When e-mailing/texting: please include your name and class. Be as specific as possible about your question (screenshots or photos are great!)

Phone: (805) 289.6242 (voicemail); **Office:** SCI-330 (third floor facing the parking lot)

Office Hours: MW 2-2:30pm in SCI-216, TWTh at 9-10am in SCI-330, W 1-2pm in STEM Harbor (SCI-223)

Please feel free to stop by my office at any time, even if it's not office hours, as I am more than happy to help whenever I can. If the door is closed, just knock; if I'm not there, I will be right back. Let me know if you wish to set up an appointment for additional help. Use me as a resource to help you with this course, whether it's the material, grading, policy, or other questions like majors, transferring, etc. I want to help!

Website: <http://mrosechemistry.weebly.com> (handouts/course information, also on Canvas)

Other Resources

STEM Harbor: In SCI-223. Visit for a schedule of drop-in hours.

Tutoring: In the Learning Resources Center (LRC), first floor of the library. Visit for a schedule of tutor hours, drop-in and by appointment

BEACH: Open, free computer and Internet access for students

Online: There are many resources online, including lecture videos on YouTube, practice worksheets from other courses, and even notes on the same topics we cover.

Course Materials

Required Materials: Safety Goggles or Glasses, lab coat
Closed-toed shoes to be worn every meeting

ChemV12AL/V12BL manual
(at the VC bookstore or <http://venturacollegeorganicchemistry.weebly.com>)
Small bottle of liquid soap & 2 quart (minimum) plastic tub
Nitrile gloves in your size
Scientific Calculator

Classroom Policy

Attendance Policy: Due to the nature of a laboratory course requiring your presence and work to be done in class to collect data, run experiments, and analyze results, attendance at every class meeting is mandatory. All experiments will be done individually and the course material must be performed during class time on the scheduled date; **there are no make-up labs for any reason**. Lab lectures that go over the information in the experiment as well as safety considerations are given at the start of each class. Tardy students that miss these lab lectures **will not be able to complete the lab**. This includes missing one day of a multi-day experiment. These experiments are quite long and science doesn't always go as planned, requiring extra repeated trials. Students who leave the lab early **will not be able to make up any missed work**. Always expect to attend every class meeting for the entire assigned time; all experiments are designed to go the full three hours.

Equipment Policy: All students are accountable for keeping equipment in the lab and the lab space clean and in good working condition every lab as we share with the many other class sections that use the room. Any chemicals, equipment, or lab space not properly cleaned, returned, and/or handled with care will cause a deduction in your individual grade and that of the entire class. You are responsible for returning the equipment in your locker at the end of the semester and anything else checked-out from the classroom at the lab period in the same condition you received it. After the check-in period, any damaged or unreturned equipment will be charged to your student account. Please make sure you return all of your equipment that you used to your drawer at the end of every lab period. Any missing or returned dirty checked-out equipment will result in a deduction to your lab grade for that experiment.

A Note on Safety: Although all experiments have been tested and the laboratory equipped and managed for your safety, accidents can and do happen due to the danger inherent in experimentation. For your own safety, you should come to class prepared with pre-reading done in the appropriate attire and pay attention to all instructions, verbal and written, when in the laboratory. **Any accidents, no matter how small, must be reported to me immediately**. That includes chemical spills, fires, electrical issues, fume inhalation, or anything else that looks suspicious, off, dangerous, or otherwise unexpected.

Academic Integrity: Cheating or plagiarizing on any assignment, quiz, or exam is strictly prohibited and will result in an automatic zero. Though most experiments in this class require sharing of equipment and data, simply copying another student's work is cheating and will be grounds for disciplinary action. Your assignments should always be completed and turned in on an individual basis, especially as these are where your quiz questions come from!

Grading Policy

Grades: All assignments' grades will be posted on Canvas throughout the year so you can keep track of your current progress. Each type of assignment carries a different weight in your final course grade to represent the effort required. Your final letter grade will be assigned based on

your final overall percentage. **Final grades are final and will not be rounded. No further credit will be offered or can be earned after final grades are posted at the end of the term.**

Grading Categories: **A** (100% - 90%), **B** (89% - 80%), **C** (79% - 70%), **D** (69% - 60%), **F** (59% - 0%)

Pre-Lab Assignments (lowest dropped)	5%
Data Sheets (lowest dropped)	10%
Post-Lab Assignments (lowest dropped)	10%
Lab Reports (one total)	10%
Quizzes (lowest quiz dropped)	50%
Lab Practical (one total)	15%

Late Work: All assignments must be turned in at the start of class on the due dates listed on the schedule. Anything turned in beyond that time will be considered late and subject to a 20% penalty. Assignments except pre-labs will be accepted up to one week past the original due date; anything later will not be accepted. The majority of your course grade is based on your weekly assignments. Don't fall behind! Always endeavor to turn them in on time, but if you really can't for whatever reason, try to get them in for late credit so that you can earn points. **Exception:** no late pre-lab assignments will be accepted.

Assignments

Pre-Lab Assignments: The more prepared you are before coming to class, the smoother each lab will go. To further prepare you, pre-lab assignments are a set of questions found at the end of each experiment in the lab manual that will ask you to refer to the lab reading about to be performed, your lecture notes, and/or outside resources. These must be completed before attending that lab meeting and are due at the beginning of class when the experiment is about to start. **No late pre-lab assignments will be accepted.** These assignments work best when done before class and will stretch you by asking about things you have not yet learned. **Your lowest pre-lab score will be dropped.**

Data Sheets: The vast majority of the labs in this course are synthesis labs. During the lab, you will need to record the amounts of reactants used, any special reaction conditions, and then the methods you used to characterize your product as well as the results you found. These data sheets will be due at the end of the class period on the last assigned experiment day. They represent the work that you did in class and will be graded on completion and accuracy of your results. **Your lowest data sheet score will be dropped.**

Post-Lab Assignments: Post-lab assignments are a set of questions found in your lab manual after the experiment text which ask you to reflect on what you did as well as additional reactions and mechanisms using the theory from the experiment. These questions will be turned in at the start of the next class period. Your grade will be based on the correctness of your answers to the post-lab questions. **Your lowest post-lab score will be dropped before final grades are determined.**

Lab Reports: Preparing professional lab reports is an essential skill for any research scientist. It is through published articles that any new discovery, data, or conclusion is accepted by the scientific community. For one experiment (Exp. 11: Multistep Synthesis of Benzilic Acid) you will

be required to submit a full, written lab report that adheres to the guidelines provided. All lab reports will be included in the calculation of your final grade.

Quizzes: Your course grade is primarily based on your individual performance, especially on quizzes. Quizzes will be given the first 20 minutes of class on the dates listed on the schedule covering material from the previous experiment. If you arrive late, you will not be allowed any extra time to complete the quiz. The questions will resemble those included on the previous experiment's post-lab assignment. You are required to have your own calculator for use on every quiz. **Your lowest quiz score will be dropped.**

Lab Final: Your lab final is cumulative. It will be an independent, individual in-class lab practical that will ask you to perform an experiment based on techniques and theories used previously in the lab. You will be graded on the accuracy of your data and its interpretation as well as completion within the assigned time. You will have two class periods in which to complete it: **Monday, May 4 and Wednesday, May 6. There are no make-ups for missed/late lab practicals; you must attend both classes when scheduled.**

About the Class

Student Learning Outcomes: This course will prepare you to do the following "big picture" concepts:

- 1.) Synthesize organic molecules using modern reaction techniques and analyze the success of each synthesis on the basis of gravimetric, spectroscopic, and chromatographic evidence and physical properties.
- 2.) Analyze unknown substances using qualitative chemical tests and to confirm the analysis using the interpretation of infrared, nuclear magnetic resonance, and gas chromatography-mass spectroscopy.
- 3.) Students will locate, identify, collect, and organize data in order to analyze, interpret, or evaluate it using mathematical skills and/or the scientific method.

See http://www.venturacollege.edu/faculty_staff/academic_resources/core_competencies/index.shtml

Course Objectives: The specific concepts we will cover are:

- A.) Formulate target compounds using appropriate starting materials, reagents, and conditions.
- B.) Propose the outcome of "what if" scenarios for organic reactions.
- C.) Identify and evaluate physical and chemical properties of organic compounds to: a. Correctly identify compounds; b. Formulate separation schemes for mixtures of organic compounds; c. Assemble appropriate glassware to accomplish separation and identification; d. Plan syntheses to produce target compounds; e. Correctly store and dispose of organic compounds.
- D.) Design and execute an experiment to make a target compound using micro-scale techniques (and continued use of macro-scale techniques).
- E.) Prepare samples for infrared and GC analysis (theory of NMR, and mass spectral analysis).
- F.) Analyze infrared and mass spectra to determine identity of organic compounds.
- G.) Evaluate the properties of organic molecules through examination of structure and composition.

- H.) Examine the MSDS resources to determine hazards and properties of organic molecules.
- I.) Qualitatively test the purity of an unknown using a chemical test.
- J.) Quantitatively calculate the amounts of reactants needed and/or product yields; in addition, determine amounts of leftover waste.

Final Notes

Check-Out: If, for any reason, you drop the course before the end of the semester, you must contact me and arrange a check-out time. Otherwise, all students will check out of their drawers the last assigned class meeting. Students who do not check-out will be subject to a \$15 fee to their student account.

The laboratory course requires your attendance and participation in every class meeting as well as your completion of the assignments due each week. Stay on top of our schedule; don't fall behind! Students who regularly attend class, complete the experiments, and turn in their assignments on time do very well! Ask for help early and often; don't wait until just before something is due. Read ahead each week and get prepared for the next. And most importantly, have fun doing some chemistry!

Important Dates to Remember

Jan. 17	Last day to enroll in the course with an add code
Jan. 17	Last day to drop with full refund
Jan. 24	Last day to drop without a "W"
Apr. 17	Last day to drop with a "W"
May 8-14	Final Exams

Chem V12BL, Organic Chemistry II Lab--Spring 2020 (30485)**Mondays and Wednesdays, 2:30pm-5:20pm in SCI-216***Tentative schedule -- subject to change*

Week	Day	Exp	Due			
1 (6-Jan)	M	Safety, Check-In				
	W	Review Packet				
2 (13-Jan)	M	1, Diels Alder Reaction	Pre-Lab 1			
	W	(cont.)				
3 (20-Jan)	M	NO CLASS -- Holiday				
	W	2, Extraction & Saponification	Post-Lab 1, Pre-Lab 2			
4 (27-Jan)	M	(cont.)				
	W	3, Salicylic Acid Synthesis	Quiz #1, Post-Lab 2, Pre-Lab 3			
5 (3-Feb)	M	(cont.)				
	W	4, Aspirin Synthesis	Post-Lab 3, Pre-Lab 4			
6 (10-Feb)	M	(cont.)				
	W	5, Vanillin Reduction	Quiz #2, Post-Lab 4, Pre-Lab 5			
7 (17-Feb)	M	NO CLASS--Holiday				
	W	(cont.)				
8 (24-Feb)	M	6, NMR Analysis	Post-Lab 5, Pre-Lab 6			
	W	(cont.)				
9 (2-Mar)	M	7, Effects in Bromination	Quiz #3, Post-Lab 6, Pre-Lab 7			
	W	(cont.)				
10 (9-Mar)	M	8, Friedel -Crafts Acylation	Post-Lab 7, Pre-Lab 8			
	W	(cont.)				
11 (16-Mar)	M	9, Dehydration-Condensation	Quiz #4, Post-Lab 8, Pre-Lab 9			
	W	(cont.)				
12 (23-Mar)	M	(cont.)				
	W	10, Diazo Dyes	Post-Lab 9, Pre-Lab 10			
13 (30-Mar)	M	(cont.)				
	W	(cont. -- tie dye)				
14 (6-Apr)	M	NO CLASS -- Spring Break				
	W					
15 (13-Apr)	M	11, Synthesis of Benzylic Acid	Quiz #5, Post-Lab 10, Pre-Lab 1			
	W	(cont.)				
16 (20-Apr)	M	(cont.)				
	W	(cont.)				
17 (27-Apr)	M	(cont.)				
	W	(cont.)	Quiz #6			
18 (4-May)	M	Lab Practical	Post-Lab 11			
	W	(cont.), Check-Out				