

**CHEM 8M – Organic Chemistry II Lab****Instructor:** A'Lester Allen (he/him)**Email:** acwiggin@ucsc.edu**HW Club (Student Hours):** Mon, Wed 3:00 – 4:00 pm**Lab Lecture:** Mon, Wed 1:00 – 2:15 pm**Teaching Assistants** – lab assignments, HW Club times, & links on Canvas

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**Course Description:** CHEM 8M (2 units) builds on the isolation and purification techniques learned in 8L, including liquid-liquid extraction, chromatography, and distillation. Synthetic organic chemistry is a broad and exciting field that requires careful analysis of compounds, many of which are clear liquids and white solids (maybe not so exciting color-wise!). Students will become proficient in compound characterization *via* thin-layer chromatography (TLC), infrared (IR) spectroscopy, and nuclear magnetic resonance (NMR) spectroscopy. Proper technical writing is emphasized.

**Prerequisites:** CHEM 8L and previous or concurrent enrollment in 8B

- **Zoom Links** to Remote Lab Lecture and Secondary Lab Sections are on Canvas.
  - This course is moves very quickly. Lectures must be attended.
  - For review, lectures are recorded and posted on Canvas and published in YuJa
- **Attendance to Tu-Th labs is required**
  - Please communicate with your TA if you lose WiFi, live in a different time zone, or have other reasonable circumstances that necessitate asynchronous participation in your secondary lab.

**Course Materials – Schedule on Page 3; organized by Module in Canvas: [canvas.ucsc.edu](https://canvas.ucsc.edu)**

- Lecture note templates – print, download, or copy by hand before Friday classes
  - Lecture recordings will be posted on Canvas
- Lab PDFs – background reading, procedure, and lab report details for each experiment
  - **GradeScope**: online tool to upload lab reports and get detailed feedback; linked through Canvas
- A designated lab notebook is not required.
  - We highly prefer students use **plain paper** WITHOUT lines for hand-written assignments.
- *Optional textbook*: David Klein, Organic Chemistry, 3rd Ed, Wiley 2017

**Course Structure & Policies**

- First lab lecture is **Friday, July 26<sup>th</sup> at 1:00 – 2:25 pm**. Attend with the Zoom link on Canvas (camera on if possible) and/or watch the video after.
- Enrolled students must be present **within the first 15 minutes of the first lab meeting (7/27/21) or risk being dropped from the course**. Email your TA and A'Lester immediately if you are absolutely unable to attend the first lab meeting so we can make other arrangements.
- Please attend your enrolled secondary lab section. If you have a reasonable excuse to miss lab, email your TA **before your lab starts** to request a makeup lab or asynchronous arrangements.
  - Email your TA if you will be late to section. It may be more appropriate to schedule a makeup lab.
- **Scheduling makeup labs:**
  - Check the lab TA schedule on Canvas.
  - Send an email to your TA and the TA in charge of your requested makeup lab, letting them know where to expect you that week.
- Please read the statements on **Academic Integrity, DRC Accommodations, Title IX, and Land Use** on pages 5-6.

### HOW THE REMOTE LAB WORKS

Experiment components and *three-to-four (3-4) associated assignments* are outlined below and organized on Canvas.

#### Before Lab

- Read the **lab PDF**, watch the **pre-lab videos**, and attend / watch **lecture**
- Prepare for the pre-lab quiz by completing the **pre-lab questions** in the lab PDF
- Take **pre-lab quiz** on Canvas before your enrolled lab section's start time
- Open that week's **worksheet** on Canvas - print, download, or copy by hand

#### During Lab

- A few minutes before, join your section's **Zoom meeting** & open **Canvas Module**.
- **Check-ins & Pre-lab talk**
- Students perform **interactive remote lab** in small groups with access to the TA for questions.
- Complete & submit a **worksheet** – data, observations, partner agreements
- **In-lab questions** are discussed as a group, along with any other Q&A.

#### After lab

- **Meet with your lab partner** to exchange and proofread each other's contributions to the lab report
- Submit the **lab report** on GradeScope, one week after experiment is performed

#### Miscellaneous Policies – Assignments & Attendance

- Consult Canvas and the schedule (next page) for experiment due dates. Email your TA before the due date / time to request an extension on assignments.
- **Email your TA (cc A'Lester) ASAP if you have any issues with attendance, submitting assignments, etc. We're open to new policies and accommodations for students in need but we need to know what's going on!**
- Students can improve by incorporating feedback from graded reports into future assignments (yay GradeScope!).
  - Your TA is happy to *discuss* any grading concerns in a kind & compassionate manner, however, we will not tolerate arguing or rude behavior.
  - Submit brief regrade requests directly in GradeScope within 1 week – instructions on Canvas.
- *If you do not turn in 2 reports or do not participate in 2 lab days without contacting the TA, you cannot pass the course.*

#### Home Lab Experiment

- Anthocyanin, a flavonoid found in red cabbage, can be used as a pH indicator.
- Students will extract anthocyanin using solid-liquid extraction techniques then test the pH of common household items
- Students work in groups to perform an experiment at home to share with their community.

#### Assignment Breakdown (1000 Point Scale)

- (100 points, 10%) **NMR Worksheet**
- (150 points, 15%) **Lab Worksheets & Academic Integrity Agreement**
- (100 points, 10%) **Pre-Lab Quizzes** – lowest quiz score dropped
- (500 points, 50%) **Lab Reports** – lowest report score dropped
- (150 points, 15%) **Home lab experiment**

## LAB AND LECTURE SCHEDULE

See Canvas Homepage for list of assignments by week &amp; materials by experiment.

Week	Date	Lecture Topic	Experiment	Assignment Due	Optional Reading
1	July 26 (Mon)	Lecture 1: Column (Liquid) Chromatography			22.3
	July 27 (Tue)	LAB DAY	Lab Orientation		
	July 28 (Wed)	Lecture 2: Chromatography			10.1-10.5
	July 29 (Thur)	LAB DAY	Exp 1		
2	Aug 2 (Mon)	Lecture 3: Acid Base Extraction & Excedrin Analysis			15.1-4
	Aug 3 (Tue)	LAB DAY	Exp 2	Exp 1	
	Aug 4 (Wed)	Lecture 4: <sup>1</sup> H NMR Chemical Shifts			15.5-6
	Aug 5 (Thur)	LAB DAY	NMR Worksheet	NMR Worksheet	
3	Aug 9 (Mon)	Lecture 5: Oxidation Rxns			12.1
	Aug 10 (Tue)	LAB DAY	Exp 3 & Writing exp. methods	Exp 2	
	Aug 11 (Wed)	Lecture 6: Fischer Esterification			22.11
	Aug 12 (Thur)	LAB DAY	Exp 4		
4	Aug 16 (Mon)	Lecture 7: Synthesis of Aspirin			15.5-6
	Aug 17 (Tue)	LAB DAY	Exp 5	Exp 3	
	Aug 18 (Wed)	Lecture 8: Anthocyanin pH Indicator & <sup>13</sup> C NMR			20.1
	Aug 19 (Thur)	LAB DAY	Home Exp	Exp 4	
5	Aug 23 (Mon)	Lecture 9: Dyes			15.11-13
	Aug 24 (Tue)	LAB DAY	Exp 6	Exp 5	
	Aug 25 (Wed)	Lecture 10: Q&A			
	Aug 26 (Thur)	NO LAB	No lab	Exp 6	

\* David Klein, Organic Chemistry, 3<sup>rd</sup> Ed, Wiley 2017 (current 8A/B text)

**Strict Grade Distribution**

A+ 98.00 – 100%	A 93.00 – 97.99%	A- 90.00 – 92.99%
B+ 88.00 – 89.99%	B 83.00 – 87.99%	B- 80.00 – 82.99%
C+ 78.00 – 79.99%		C 70.00 – 77.99%
D 55.0 – 69.99%		F < 55.0%

Lab Preparation

Pre-Lab Video(s) - Most if not all Canvas Modules have a page with animated concept videos to watch before the lab meeting. These should help you get familiar with the experiment and underlying principles.

PRE-LAB QUIZ – Experiments PDFs containing pre-lab questions are posted on Canvas. Take the Canvas pre-lab quiz before your enrolled section. The quiz includes pre-lab questions that may be reworded, in a different order, or otherwise be presented differently than the pre-lab questions. This is due to the Canvas quiz format, not to confuse you!

- **Be prepared with your responses to the pre-lab questions before starting the quiz.**
- There is a 20-minute time limit on the quiz and you get two attempts.
  - **Make sure you have enough time to complete the quiz - you can't save and come back later.**
  - If you choose to re-take the quiz, your grade will be the highest of the two attempts.
- The lowest pre-lab quiz grade is dropped.
- **Though we generally encourage collaboration, the pre-lab quiz is an individual assignment.**
  - The responses should be a product of your original work to assess *your* understanding of the material.
  - **Sharing your quiz or the correct responses in any format (screenshots, email, CHEGG, social media, text, carrier pigeon, etc.) is in violation of the UCSC academic integrity policy (more details later in syllabus).**

Lab Reports

**Reports are completed in pairs and are due according to the schedule above, by midnight on the enrolled lab day.** Students select parts of the report to complete, then meet to exchange and proofread each other's work at least a day or two before the due date. The idea is to promote collaboration and hold each other accountable. One student submits the assignment on Canvas / GradeScope and both students get that same grade. Make sure to select your partner after uploading the report to GradeScope!! The lowest report score is dropped.

Reports are **typed** with the exception of any figures, structures, mechanisms, and calculations. The components are described below and additional **writing guidelines** are online.

***Get help with your assignments, ideally during lab or at least several days before the due date!***

EXPERIMENTAL DETAILS AND CHARACTERIZATION

- This section applies to Exp's 3-6 reports. No experimental section in Exp's 1-2 reports.
- Day 1 of lab is an activity specifically on how to write the first experimental section (Exp 3)
- Use the writing guidelines and specific notes in the experiment PDF
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LAB NOTEBOOK PAGES – TURNED IN WITH LAB WORKSHEET; LAB WORKSHEET IS DUE AT MIDNIGHT ON THE DAY OF LAB

It does not make sense to expect you to write the step-by-step procedure in words when you are not carrying out the experiment yourself! Each lab PDF on Canvas has templates with experiment segments and requirements for that lab. **All equipment, chemicals and amounts, and safety notes must be present in each segment for full credit.** Draw **diagrams** to explain key parts of the procedure with limited words, including equipment and chemical names. A full step-wise procedure is NOT required or expected.

IN-LAB QUESTIONS

- *Randomized data is provided by the TA or within the remote lab itself.*
- Type the responses to in-lab questions in complete sentences.
- Calculations, structures, and mechanisms may be hand-written.
- Tables should be given clear labels (**Table 1**, etc.) and a descriptive title.

**Neatness & Organization**

- Refer to report guidelines above, in the experiment handout, and the writing guidelines.
- This includes spelling, grammar, format, and overall clarity.

**Participation (formerly Lab Technique)**

- Attendance & participation in lab will be tracked through Zoom polls.
- Participation credit is given by submitting a **Worksheet** at the end of lab.
- Please be present within the first 10 minutes of lab for credit in the first poll.

**Academic Integrity** - [https://www.ue.ucsc.edu/academic\\_integrity](https://www.ue.ucsc.edu/academic_integrity)

**Complete the Academic Integrity Agreement form on Canvas**

Students are encouraged to discuss the experiments. Below is an overview of assignments that should be completed individually vs. those that are turned in with a partner. A pair of students come up with a **Partner Agreement** on the day of lab to determine how they'll complete the assignment. One student submits the final assignment on Canvas / GradeScope and both students get that same grade. The idea is to incentivize collaboration and hold each other accountable.

- **Individual:** Pre-lab quizzes, Worksheets with Notebook Pages
- **Pairs:** Lab reports –in-lab questions; some experiments also require an abstract

Collaboration is great, but each partnership should submit original work. *Zero points will be assigned to duplicate lab reports, or sections of lab reports that are obviously copied from another group, at the TA's discretion.* Such incidents will be reported to the UCSC Academic Misconduct office. This is an unfortunate but necessary consequence.

We want our **expectations** of you to be clear to set you up for success! Please feel free to **reach out** to instructors to talk through this process and **ask questions** whenever you feel unsure. I put together the guidelines below after reflecting on **discussions with students**.

**HOW TO HAVE GREAT ACADEMIC INTEGRITY:**

- Use the provided writing guidelines for general style and specific abstract format.
- **Everyone is expected to submit assignments that reflect their and/or their partner's understanding of the material** based on the reading, lecture, discussion with instructors and peers, and personal lab experience.
- The experiment PDFs online contain most of the information you need to successfully complete assignments, with elaboration and clarification in lab and lecture. It may be necessary to look up new terms or general concepts, but otherwise *avoid searching for answers to pre- and in-lab questions online.*
- **Prevent the temptation to cheat** by working on assignments **well in advance of the due date**.
  - Ask instructors for help during lab and office hours.
  - Feel free to reach out *via* email if you need an extra day or two extension.
- *Both students in a lab pair should contribute to the remote lab, including recording observations and writing the lab report.*
  - Each student submits a **Partner Agreement & Data / Observations** at the end of each lab period.
  - TAs will confirm that work is done collaboratively and help reduce miscommunication between partners.
- Perform calculations and analysis *individually before discussing* with another student.
- Talk through the question with lab mates and instructors.
- Ask for help on **how to solve a problem** rather than asking for an answer.
- **Type all of your own work instead of copy/pasting from other sources.**
- Lab partners are encouraged to **proofread** each other's work after a draft has been completed.

- Avoid searching for answers to pre- and in-lab questions online. This knowledge is provided in the experiment PDFs, lab lectures, and remote labs. Online sources can be problematic and often wrong!
- Reading and posting lab reports or any other course materials on sites like CHEGG and Course Hero *violates UCSC academic integrity policy*. The same applies to using paper or electronic copies of **old lab reports**. *If someone offers you their old reports, don't accept them or give them back!* The questions and criteria change each term, making these instances relatively easy to catch.
- **Reading another group's report then rewording it is considered cheating**, as this is not reflecting your own ideas or understanding.
- Do not copy/paste from other unauthorized sources, then alter it to make it look different.
- **I recommend not emailing reports to anyone outside of your group** unless it's to proofread and you know the other group has completed their work too.

### Disability Accommodation

UC Santa Cruz is committed to creating an academic environment that supports its diverse student body. If you are a student with a disability who requires accommodations to achieve equal access in this course, **submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) using the form on Canvas** – Home Page or Quizzes, preferably within the first two weeks of the quarter. We can set up a time to meet and discuss how to ensure your full participation in the course. *This may also include **scheduling make-up labs if there are time conflicts due to extended exam times** for other courses.* We encourage all students who may benefit from learning more about DRC services to contact DRC by phone at [831-459-2089](tel:831-459-2089) or by email at [drc@ucsc.edu](mailto:drc@ucsc.edu).

Title IX prohibits gender discrimination, including sexual harassment, domestic and dating violence, sexual assault, and stalking. If you have experienced sexual harassment or sexual violence, you can receive confidential support and advocacy at the Campus Advocacy Resources & Education (CARE) Office by calling (831) 502-2273. In addition, Counseling & Psychological Services (CAPS) can provide confidential, counseling support, (831) 459-2628. You can also report gender discrimination directly to the University's Title IX Office, (831) 459-2462. Reports to law enforcement can be made to UCPD, (831) 459-2231 ext. 1. For emergencies call 911.

Faculty and Teaching Assistants are required under the UC Policy on Sexual Violence and Sexual Harassment to inform the Title IX Office should they become aware that you or any other student has experienced sexual violence or sexual harassment.

### Land Acknowledgement

"The land on which we [would] gather [if we were meeting in person] is the unceded territory of the Awaswas-speaking Uypi Tribe. The Amah Mutsun Tribal Band, comprised of the descendants of indigenous people taken to missions Santa Cruz and San Juan Bautista during Spanish colonization of the Central Coast, is today working hard to restore traditional stewardship practices on these lands and heal from historical trauma."

**Lab Conduct...*Safety first!***

The safety rules below do not apply to the remote labs but it's worth keeping in the syllabus ☺

- No food or drink in the lab; Wear proper attire and arrive to lab on time
- **Goggles, gloves, and lab coats** are to be properly worn when anyone is using chemicals in the lab or instrument room – points deducted for not wearing personal protective equipment (PPE)
- Pay attention to **waste procedures and chemical hazards** – table given in each experiment
- Take care of chemical spills immediately; consult the instructor
- Notify your TA of all chemical exposures; **rinse minor exposure areas with water for 15 min**
- Label all glassware before adding chemicals to it, including water
- **Clean the balance and reagent areas immediately** after obtaining chemicals every time
- Keep your work station clean; follow instructions on washing glassware - remove gloves
- **Check your results and workstation with your TA at the end of each lab**
- Foster a sense of community – ask your TA for a community cleanup task before you leave
- **ABSOLUTELY NO GLASS IN THE TRASHCANS**