

CHEM 8L – Organic Chemistry I Lab**Instructor:** Caitlin Binder, Ph. D.**Email:** cambinde@ucsc.edu**Teaching Assistants** – office hours announced in first lab, updated onlineDavid Delgadillo - daadelga@ucsc.eduGrant Koch - gakoch@ucsc.eduEric Queen - epqueen@ucsc.eduLongbo Li - l1i69@ucsc.eduJohn Saunders - jmsaunde@ucsc.eduJenny Stenger-Smith - jrstenge@ucsc.eduDuy Vo - duvo@ucsc.edu**Office Location:** Thimann Labs 313**Office hours:** TuTh 2:30 – 4 p.m. or by appt.Ariel Kuhn - ajkuhn@ucsc.eduJonathan Philpott - jphilpot@ucsc.eduBrian Kawahara - bkawahar@ucsc.eduRyan Noland - rnloland@ucsc.eduPatrick Skelly - pskelly@ucsc.eduJerin Tasnim - jtasnim@ucsc.edu

Course Description: CHEM 8L (2 units, formerly 108L) is an introduction to common methods in synthetic organic chemistry, as it applies to pharmaceutical and research industries. Students will learn basic techniques for isolation and purification of organic chemicals, as well as qualitative and quantitative analysis. These fundamental skills will be applied in organic reactions. Students will learn to perform lab work in a safe and efficient manner. Technical writing is emphasized. **Course Prerequisites:** CHEM 1C and 1N and previous or concurrent enrollment in 8A.

Required Materials

- Access to **Course Website:** <https://acrochem.sites.ucsc.edu/chem-108l/>
- Mohrig, J. R.; Hammond, C. N. ; Schatz, P. F. "Techniques in Organic Chemistry, 4th Edition" Freeman, 2015 (other editions acceptable, use lecture titles for reading assignments)
- Lab Notebook with duplicate pages and safety goggles (shared goggles and lab coat provided)
- Optional: You may purchase your own lab coat and safety goggles, bring with you each day.

Course Policies Overview – see page 5 for more detail

- Attendance to lab lecture is mandatory, beginning 9/29.
 - Attendance quizzes are given in periodically lecture. You must be present for credit, no exceptions.
 - I do not give out lecture notes but webcasts are available several days after lecture (<https://webcast.ucsc.edu>). Username and password will be emailed to you and posted online when available. The webcasts should not be a substitute for coming to class!
- Enrolled students must be present and dressed appropriately at the first lab meeting, beginning 10/3. Students that are more than **15 minutes late or not dressed for lab will be dropped.**
- There will be **no section switching** after the first lab meeting.
- Starting the second meeting of lab, if you are more than **two minutes late**, you cannot take the pre-lab quiz. If you are more than **five minutes late**, you cannot participate in that lab (see page 5).
- Attend every lab during your enrolled section. If you have a reasonable excuse to miss lab, email me and cc your TA **before your lab starts** (see page 5 for details to include). You are not guaranteed a make-up lab due to limited space but we'll try! **TA's do not arrange make-up labs.**
- If you miss or come to lab late, unprepared, or are asked to leave the lab for violating any safety rules (including dress code), you are **not eligible for a make-up but may be eligible for partial credit.** Communicate with the TA **before the end of lab** or this offer expires, no exceptions (see page 5).
- Consult the schedule for experiment due dates. Assume **no late lab reports** will be accepted unless **permission is given by your TA before the due date.**
- *If you do not turn in 2 reports or are not present 2 lab days for any reason, you cannot pass the course.*

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, please submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to me privately during my office hours or by appointment, preferably within the first two weeks of the quarter. At this time, we would also like us to discuss ways we can ensure your full participation in the course. *This may 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.

Academic Integrity - https://www.ue.ucsc.edu/academic_integrity: Students work in pairs for most labs and are encouraged to discuss experiments with each other, but *each student turns in an individual report*. Avoid copy/pasting from someone else's work, including web sources and lab reports borrowed from a student from another term (**assignments change each quarter!**). Your TA will look out for blatant copying – it is pretty obvious! *Zero points will be assigned to duplicate lab reports, or sections of lab reports that are obviously copied, at the TA's discretion.* The following are a few suggestions and clarifications to avoid issues.

- Both students in a lab pair must perform roughly the same amount of hands-on lab work. If a TA finds only one student is performing the lab out of a pair, a warning will be issued. **A second offense will result in dismissal from the lab and possibly from the course.**
- Record raw data individually, rather than copying from a lab partner.
- Perform calculations and analysis individually before comparing answers with another student.
- Abstracts are to be completed individually using the provided guidelines. Lab partners are encouraged to proofread each other's work only after a draft has been completed. Consult the TA for help as well.

Lab Conduct: Safety first! Success and fun in the lab comes with following established guidelines. With more advanced labs comes the responsibility of more potentially dangerous chemicals and procedures. Students are expected to act responsibly and respectfully toward everyone in lab. A comprehensive list of safety rules is on p. 6-7 of this syllabus. An abbreviated version is below. **Violations are taken very seriously – point penalties, dismissal from lab, or dismissal from the course (D).**

- CELL PHONES OFF AND AWAY! Prevent contamination and do not use phones in the lab.
- No food or drink in the lab, including items in backpacks
- Wear proper attire and arrive to lab early to review the procedure.
- Be sure you understand the full procedure before beginning an experiment. Review lecture notes and go to office hours for help with this.
- No running, or otherwise 'horsing around' during lab; keep belongings out of the way
- Report and take care of chemical spills immediately; feel free to ask for help!
- **Your assigned locker must be complete, clean, and organized before leaving lab each day.**
- Pay attention to waste procedures and chemical hazards.
- Label all glassware at every stage of an experiment.
- Help your lab-mates clean up if you are done early.
- **ABSOLUTELY NO GLASS IN THE TRASHCANS, INCLUDING PIPETS**

Lecture Etiquette: Students are expected to treat the instructors and fellow students respectfully!

** The best way to succeed in the lab is to attend every lecture. A thorough description of the principles and procedures for each experiment will be presented, including calculations and analyses.

* You are welcome to ask questions in lecture. It's more fun that way!

* In anticipation of the holidays at the end of the quarter, *Friday's lab lectures cover experiments as much as two weeks ahead of time. Stick to the reading schedule to stay engaged in class.*

* **It is recommended that students begin preparing the pertinent notebook assignment and pre-lab questions before lecture to aid in comprehension.**

* **Webcasts:** audio and projections from lecture will be posted online. Login credentials will be provided by email and updated on the class website. Use webcasts to review material and supplement your notes. This is not a substitute for attending lecture, as it may take several days for lectures to be available. Any technical or login issues should be directed to webcast@ucsc.edu.

* You are responsible for getting notes from another student if you miss lecture. I do not give out lecture notes. Please do not email me to ask if I went over anything important in lecture; it's all important!!

* Quizzes will be given in lecture periodically and students must be present for credit. These quizzes are unannounced and no make-up quizzes or credit is given, no exceptions.

* Come to class on-time, stay for the duration. **Please wait to pack up until I have dismissed the class.**

* Please do not talk while the instructor is talking.

* **CELL PHONES OFF AND AWAY! Do not take pictures or video in class. I am not comfortable with this and you do not have my consent unless I say otherwise in class** (remember, the webcasts are available a few days after class). Please write notes by hand.

* **Tablets are great but laptops less useful for note-taking.** Ask permission to use other electronic note-taking devices or I will ask you to put it away during class, as this can be distracting. Thank you!

Description of Assignments:

Experiments and supplemental course materials, including links to video tutorials, are posted online. Reading assignments are from Mohrig, et. al. "Techniques in Organic Chemistry, 4th Edition." A schedule of reading assignments is on the last page of the syllabus. Read each section thoroughly before lecture and lab. Other editions and texts are suitable – use the lecture topics to prepare. Arrive to lab on time with a prepared lab notebook per the guidelines below. You cannot bring/use the text or handouts in lab unless otherwise instructed.

Lab Notebooks: See sample notebook page provided online and read specific instructions in lab handouts. Write in pen (no pencil). If you make a mistake, use a single-line strike-through (no scribbles), NO WHITE-OUT!

Be prepared, no surprises! Your TA will check your lab notebook before you enter the lab (see below). You cannot stay to perform the lab if your notebook is not properly prepared with each section below.

- Experiment Number, Title, Your Name, Lab Partner Name, Date, Section Day/Time
- **Purpose** – one sentence plus scheme with structures & abbreviations
- **Reagent Table**
 - For each chemical used, make a table with chemical name or abbreviation, molecular mass, moles used (mmol), mass or volume used (mg or mL), molar equivalents (for reactions only), bp/mp, density, and relevant hazards (flammable, corrosive, lachrymator, pyrophoric, hygroscopic, etc.). The hazards are listed in the safety tables at the end of each handout and chemical properties can be found at www.sigmaaldrich.com.
- **Full hand-written, step-by-step procedure with diagrams.** DO NOT copy directly from the handouts. This should be in your own words. You can number your procedure, use bullet points, or any other format that will be useful to you or a lab mate in easily following your own instructions in the lab. The included diagrams should be of glassware, especially if it's new to you, and/or flow chart that complements the written procedure. This is not a substitute for the hand-written procedure.
- **Waste and Clean-up Notes.** Copy and pay attention to notes in the handout and announcements in lecture/lab.
- **In-Lab Questions.** Copy an abbreviated version of these questions into the notebook to ensure you will obtain all the necessary data before leaving. The questions will be answered during or after lab.

Introduction (Pre-Lab Questions)

- Include a header at the top of the page with your name, section letter, day, time, and room number. A title should appear as well, such as "Exp 1 Introduction".
- **Responses to pre-lab questions** are to be numbered, written in complete sentences, neatly *typed*, printed, and handed in to your TA at the very beginning of the lab period (as you walk in the door). Your TA will return these to you the day the report is due.
- DO NOT re-type the question exactly but DO re-word the question as part of your answer.
- You may leave space to hand-write structures, mechanisms, calculations, etc. in PEN. Responses in pencil will not be graded.
- **Do not wait until the last minute to print this out.** *This is your only opportunity to get credit for the pre-lab questions - no exceptions for printer issues, etc.*
- The pre-lab questions will not be graded if the TA's initials are not present. Altering pre-lab questions after turning them in would qualify as academic dishonesty and you will receive zero points for that section of the lab report. A second infraction will not be tolerated (see Academic Integrity on page 2).
- **Get help with your introduction before it is due!**

Pre-lab Quizzes – There will be a short quiz at the beginning of lab to assess your preparation. If you read the lab handout and put thought into the pre-lab questions, this should be easy! If you are 2+ minutes late to lab, you cannot take the quiz, no exceptions.

Assignments, cont'd.**Lab Reports (70%)**

Reports are due at the beginning of lab on the due date (see schedule) and are to be **typed** (with the exception of notebook pages, figures, structures, and calculations) in the format outlined below and according to technical writing guidelines given on the first of lab, also online.

The components are as follows. Consult the specific grading rubric found at the end of each lab handout. The lab report must be in the order indicated in the grading rubric. Your TA may have specific instructions or expectations. Pay attention to in-class announcements and get help with your pre-lab questions and reports before they are due!

- **Abstract** – use guidelines handed out on the first day of lab, also online
 - Grading rubric at the end of each experiment PDF indicates whether an abstract is required.
 - 4-6 sentences: purpose, procedure overview, main result(s), and conclusions.
- **Introduction** - original pre-lab responses with TA initials, see description on previous page
 - Your TA will either hand these back on the report due date or attach it themselves.
- **Results** – Typed responses to in-lab questions in complete sentences
 - You may hand-write calculations, structures, and mechanisms.
 - Tables should be given clear labels (**Table 1**, etc.) and a descriptive title.
- **Lab Notebook Pages** – hand-written
 - Tear out the carbon-copy pages from your notebook for that lab and attach to the lab report. DO NOT re-write or alter your experimental notebook pages once the lab is completed, except to complete calculations or analysis.
 - TA initials should be present, indicating you left the lab with all proper data and analyses.
- **Pre-Lab Quiz, Neatness & Organization**, 10-20% of each report.
 - Refer to report guidelines in the syllabus, experiment handout, and technical writing guidelines when putting together every report. This is where students receive credit for proper format, spelling, grammar, and otherwise following instructions on writing the report.
- **Lab Technique**, 5-10% of each report
 - Students will be assessed on their ability to safely carry out experiments using proper techniques as described in the safety rules (p. 6-7), experiments posted online, and any other demonstrations or instructions given by TAs in lab.
 - **Students must check out with the TA for a notebook and cleanup check before leaving every lab, otherwise zero points are awarded for this section. This includes an item-by-item drawer check. Points are lost for each item dirty, extra, or missing.**

Lab Practical Exam (25%)

- Each student will perform this experiment individually using the prepared lab notebook in 1 hr, 45 min without help from classmates or the TA (no talking).
- Your lab practical time will be assigned one-to-two weeks before the exam as either the *first or second half of your regular 4-hour lab time*. You will get a zero for the exam if you miss your time.
- Students prepare for the lab practical (Exp 6) just like any other (notebook & pre-lab questions). The experiment will be discussed in the last lecture and full experiment details are available online.

Grade Distribution

A+ 98.0 – 100%	A 93.0 – 97.9%	A- 90.0 – 92.9%
B+ 88.0 – 89.9%	B 83.0 – 87.8%	B- 80.0 – 82.9%
C+ 78.0 – 79.9%	C 70.0 – 77.9%	
D 55.0 – 69.9%		F < 55.0%

COURSE ASSESSMENT**Assignments Overview**

- * Read **lab handouts and text assignments** before lecture and to prepare for lab.
- * Prepare your **lab notebook** and **pre-lab questions** before each lab (see guidelines).
- * Be prepared for a short **pre-lab quiz** at the beginning of every lab.
- * Turn in **six individual lab reports** (due dates in schedule).
- * **Final Lab Practical Exam** assessing student's ability to independently complete an experiment.

Grade Breakdown**1000 Point Scale:**

- (10 points, 1%) **Lecture Attendance** – unannounced
- (40 points, 4%) **Safety Orientation, Writing, & Error Analysis Activities (Intro Packet)**
- (700 points, 70%) **Lab Reports**

(250 points, 25%) **Final Lab Practical Exam** – week 9

* **Students must get a minimum of 60% on the final lab practical exam to pass the course**, even if lab report grades are in the passing range.

Detailed Enrollment & Grading Policies

- * **Students are to keep a record of their own graded assignments.**
 - * Grading rubrics provide point breakdowns for each lab section of the report. Your TA is happy to discuss any grading concerns, however, we do not tolerate arguing or rude behavior. Thank you!
- * **Students must perform all labs and turn in all lab reports.**
 - * One missed lab = 10% of overall course grade is lost, meeting half-way policy may apply (see below)
 - * Missing two lab periods = grade is dropped to a D and student will have to re-take the course.
- * **The following conditions will keep students from performing the lab...**
 - * Arriving to lab unprepared, including missing notebook components and improper attire
 - * Arriving to lab late (more than 5 minutes)
 - * Not abiding by safety rules, procedures, or TA instructions

Make-up Policy - This offer expires 5 minutes after your lab section starts!

- All make-up labs must be completed within the same week and are scheduled by Dr. B only.
- Two week's notice is recommended for make-up consideration if possible.
- Emergency or last-minute situations (illness or otherwise) will be handled on a case-by-case basis: If you cannot physically make it to lab, email Dr. B & your TA *before your section starts* with your section information and requested make-up time(s).
- **Email Dr. B (cc your TA) with your section information (day, time, room) and all possible make-up lab time(s) that same week. Please check the section list online for lab times.**
- We want to help but you must communicate with us in a timely manner.

"Meeting Half Way" Policy = you are 5+ min late, missed lab, or are not prepared AND do not contact us before your lab starts...

- **You are not eligible for a make-up lab, no exceptions.**
- If possible, go to lab before it ends to **turn in your introduction, notebook pages, and report**.
- If you cannot physically come to lab, send us (Dr. B & your TA) an email to make arrangements to turn in the introduction and at least show completed notebook pages to your TA ASAP.
- **Leave your lab report in your TAs mailbox in PSB** if one is due the week you missed.
- Turn in the grading rubric the following week. At minimum, you will get credit for the intro and notebook pages (roughly 50% of the report is better than 0%). You are welcome to complete other parts of the report for feedback but will not get credit.
- **This offer expires the minute your lab is over!**
- **Students who miss lab and follow the "meeting half way" policy are still eligible for an A in the course, provided the rest of the reports have excellent scores. You only get one of these!**

LABORATORY SAFETY RULES AND AGREEMENT
Safety First!

The instructors wish students an enjoyable lab experience! The best way to set you up for success is to provide you with lab common sense and etiquette, as much of the surroundings and techniques will be new to you. You will sign a contract on the first day of lab, stating that you agree to abide by these rules. In general, be respectful of the space, follow instructions, and you'll be fine, however...

*...minor violations of the rules below may result in points being taken off the report, either for an individual or the whole section. Negligent and/or intentional violation of any of the rules below may result in you being removed from the lab and/or you will receive ZERO for results portions of the lab (credit granted for preparation only – introduction & notebook). A second violation will result in you being dropped from the course. **No make-up labs for students who violate these rules.***

1. **Safety goggles must be worn** at all times when anyone in the room is working with chemicals, especially yourself! You are welcome to step outside to defog goggles if necessary.
2. **NO food, drinks, or gum** are allowed anywhere in the labs or in your mouth while you're in the labs. All water bottles, snacks, etc. should be left on the table outside the lab, not hidden in your bag. You may step into the hallway for a quick drink or snack during appropriate times, as long as you're not neglecting the experiment or your partner. Please check with your TA beforehand.
3. **Appropriate lab attire** must be worn at every lab meeting. Students cannot go home to change.
 - **OK LAB ATTIRE:** Pants or long skirt, short or long-sleeve shirt, closed-toe shoes that cover the entire top of the foot. Long hair and loose clothing are confined or tied back.
 - **NOT OK:** Shorts or short skirts (no exposed ankles), *leggings/tights*, cropped pants that expose ankles, ripped pants that expose skin, tank tops, sandals, ballet flats, or any other shoes that expose the tops of the feet (Crocs and Tom's are NOT OK!). High heels, baggy clothing, and dangling jewelry are strongly discouraged.
4. **Lab coats** must be worn over appropriate lab attire (see above).
5. **NO running, fighting, or other acts of mischief.**
6. **NO visitors**, including pets and side-kicks.
7. Know the **locations of emergency equipment** including fire alarms, fire extinguishers, chemical fume hoods, safety showers, and emergency eye washes.
8. **Notify your instructor immediately of any injury, spill, fire, or explosion.** You may clean up small spills (less than a few milliliters) yourself, but let the TA know. You're not in trouble unless you do it on purpose!
9. Keep your lab space **clean and organized throughout the experiment**. Backpacks, purses, jackets, phones, etc. are not allowed where chemicals are being used.
10. Keep an eye on your work and **never leave an ongoing experiment unattended**. If you need to leave the room, be sure a neighbor is watching your experiment.
11. Unless otherwise specified, dispose of broken glassware in broken glassware boxes only, including ceramics and disposable glass pipets. NO paper or other items should go in the broken glass boxes. **NO PIPETS OR OTHER GLASSWARE IN THE TRASH!** That's not cool to the staff and you'll lose points.
12. **DO NOT TASTE ANYTHING IN THE LAB.** EVER.
13. **Never remove chemicals or equipment** from the labs or stockroom without permission.
14. **NO unauthorized experiments.** Stick to the given procedure.

15. Follow appropriate procedures for inserting glass into a stopper and/or have the stockroom or your TA assist you. Seriously, students have hurt themselves by not paying attention.

16. Wash your hands and arms with soap and water before you leave the lab, no matter what!

17. Always know the **hazards** as well as the physical and chemical properties of the materials used. Your lab notebook should include a brief note on the safety hazards for each chemical being used based on the safety table within in the experiment.

18. **Read labels carefully and know the name of chemicals with which you are working.** Read labels twice. Read labels twice.

19. **Label all containers** with chemical/mixture names, your name, and the date **before** anything goes into that container.

20. **Use pluringes and pipet bulbs with glass pipets.** NEVER pipet by mouth. It's gross.

21. Check all **glassware for cracks and cleanliness** before using...or you'll be sorry later that you didn't.

22. **Avoid contamination.** Take only what you need from reagent bottles and NEVER return unused chemicals to the original bottle that other students are sharing.

23. **Fume hoods** are often used to minimize chemical exposure. Handle chemicals six inches into the hood. DO NOT PUT YOUR HEAD IN THE HOOD and DO NOT KNEEL IN FRONT OF THE HOOD, or anywhere in the lab.

24. **Wash all glassware before leaving lab for the day and return all shared equipment to the designated space.**

25. **Dispose of all waste as instructed in the lab handout or by the TA.** Read waste container labels carefully to be sure it's going to the right place. Waste containers are typically in the fume hoods. Let your TA know if a waste container is full. DO NOT LET THE WASTE CONTAINERS OVERFLOW! *Seriously, who does that?!*

26. **NO use of flame in the lab.** Nearly everything in the organic chemistry labs is flammable.

27. **Wear gloves** when appropriate in the lab and **change your gloves** if you get chemicals on them. They're cheap! Gloves are only a first line of protection. They do not make you invincible! Take off gloves before you leave the room. **DO NOT touch door handles, your face, computers, or phones with gloved hands.**

28. **Minimize chemical exposure** (ex. keep containers capped) and treat every chemical as if it were hazardous.

29. **No cell phones or electronic devices are allowed to be used in the labs.** If you'd like to take a picture or video of your experiment, ask your TA for permission, but take your gloves off first.

30. Treat your TA respectfully and abide by any of his/her instructions and additional rules announced.

GOLDEN RULE: Your drawer must be pristine at the end of each lab.

- All equipment must be clean and organized in the drawer. Check the equipment list and picture of the perfect drawer on the bulletin board in the lab.
- Obtain any missing items from the stockroom. Do not bring broken items to the stockroom!
- **Drawer penalties - points taken off for each missing, dirty, broken, or extra item. Additional points taken off for disorganization, at the TA's discretion.**
 - 1 pt / item Exp 1; 2 pts / item Exp 2, Day 1; 3 pts / item Exp 2, Day 2 and so on...

LECTURE AND LAB SCHEDULE

Week	Labs (Tu-Th) Experiments online	Lecture Topic, Fridays** Reading Assignment (Mohrig 4)
<i>Prior to the first experiment, read the sections of the text on safety and general lab technique (Mohrig Chapters 1-4). If using the Palleros text or another edition of Mohrig, use the table of contents to read the proper sections based on lecture topics below.</i>		
-		9/29 - Recrystallization & Melting Point <i>Exp 1; Chapters 9, 14, & 15</i>
1	10/3-10/5 - First Lab Meeting Mandatory check-in Safety, Writing, & Error Analysis	10/6 – Boiling Points & Distillation <i>Exp 2; Chapter 12 (*12.2a)</i>
2	10/10-10/12 - solo Exp 1 - Recrystallization of Acetanilide <u>Due 10/17-10/19</u>	10/13 - Gas Chromatography <i>Exp 2; Chapter 20</i>
3	10/17-10/19 - pairs Exp 2 - Citrus Oil (Isolation) **BYO Grated, Fragrant Citrus Peels** <u>Due 10/31-11/2</u>	10/20 – Thin-Layer Chromatography (TLC) & Liquid-Liquid Extraction <i>Exp 3; Chapters 9-11 (TLC reading in Exp 3)</i>
4	10/24-10/26 - pairs Exp 2 - Citrus Oil (GC Analysis) <u>Due 10/31-11/2</u>	10/27 – Infrared (IR) Spectroscopy <i>Exp 4; Chapter 21</i>
5	10/31-11/2 - pairs Exp 3 - Spinach/TLC **BYO Spinach** <u>Due 11/7-11/9</u>	11/3 - Elimination Reactions <i>Exp 5; Chapter 16.6-16.7</i> <i>Also McMurry* 7.9, 11.7-11.10, 17.6</i>
6	11/7-11/9 - pairs Exp 4 - IR Exercise <u>Due 11/14-11/16</u>	11/10 – No Lecture, Veteran's Day
7	11/14-11/16 - solo Exp 5 - Dehydration of Methylcyclohexanols <u>Due 11/21 in TA mailbox by 5 pm</u>	11/17 – Substitution Reactions, Lab Practical Details <i>Exp 6; Chapter 5.3, 6.1, 7.1</i> <i>Also McMurry* Chapter 11</i>
8	11/21-11/23 Thanksgiving – No Labs	11/24 – No Lecture
9	11/28-11/30 LAB PRACTICAL EXAM - solo Exp 6 - Synthesis of <i>t</i> -pentyl chloride <u>Due at the end of lab</u>	12/1 – No Lecture
10	12/5-12/7 – No Labs	12/8 – No Lecture

*McMurry's Organic Chemistry, 8th Edition (8A text) – supplemental reading on organic reactions

**Due to the multiple holidays, experiments are described in lecture up to 2 weeks ahead of time.