# CHEM 2315 Tentative Schedule – Fall 2021

**(Subject to moderate change)**

**Labs held on Mondays, 8:00 p.m. – 10:50 p.m., in Bingham Building Room 134**

| | Experiment | Pages Due at the Start of Class | Pages Due at the End of Class |
|---|---|---|---|
| | **8/30**<br>Course Policies, **Lab Safety Quiz**, Check-In<br>**Synthesis Report:** assignment explained and given – *due by 11/1* | **None** | **None** |
| **9/6** | **No Lab – Labor Day** | | |
| **1** | **9/13**<br>[1]Fermentation of sucrose (pages 15-16), FTIR orientation | **None** | Lab notebook pages for **fermentation of sucrose** |
| | **9/20**<br>[1]Simple distillation of ethanol (pages 17-18) **Miniscale** | **None** | Lab notebook pages for **distillation of ethanol** |
| **2** | **9/27**<br>[2]Cylcohexanol Dehydration | Lab report #1: **sucrose fermentation & ethanol distillation** | Lab notebook pages for **Cylcohexanol Dehydration** |
| **3** | **10/4**<br>[2]Thin Layer Chromatography (TLC) of Mint Extracts | Lab report #2: **Cylcohexanol Dehydration** | Lab notebook pages for **(TLC) of Mint Extracts** |
| **4** | **10/11**<br>[2]Chemically Active Extraction<br>**(REPORT DUE ON 10/25)** | Lab report #3: **(TLC) of Mint Extracts** | Lab notebook pages for **Chemically Active Extraction** |
| **5** | **10/18**<br>[2]Molecular Modeling and Conformational Analysis | Lab report #4: **Chemically Active Extraction** | Lab notebook pages for **Molecular Modeling** |
| **6** | **10/25**<br>[2]Cyclohexane Conformations | Lab report #5: **Molecular Modeling** | Lab notebook pages for **Cyclohexane Conformations** |
| **7** | **11/1**<br>[2]SN1 and SN2 Reactions of Alkyl Halides | Lab report #6: **Cyclohexane Conformations**<br>**Synthesis Report due at the start of class** | Lab notebook pages for **SN1/SN2 rxns of Alkyl Halides** |
| **8** | **11/8**<br>[2]Recrystallization | Lab report #7: **SN1/SN2 rxns of Alkyl Halides** | Lab notebook pages for **Recrystallization** |
| **9** | **11/15**<br>[1]NMR orientation (procedure will be posted on Canvas) | Lab report #8: **recrystallization** | Lab notebook pages for **NMR orientation** |
| | **11/22**<br>TA/Course Evaluations, Clean Up, Check Out | Lab report #9: **NMR orientation** | **None** |

[1] Copies of these experiments are posted on our Canvas homepage.

[2] These experiments are available online at: http://ion.chem.usu.edu/~harrisd/Classes/2315/CHEM%202315.html. The password is “goggles4u”.

# CHEMISTRY 2315 – Fall 2021
## Organic Chemistry Lab I
## Mondays, 8:00 – 10:50 p.m., Bingham Building Room B134

**General Information**

**Instructor:** Dr. Mike Christiansen (please just call me Mike)
**Email:** m.christiansen@usu.edu **Office:** 221G Bingham Building
**Phone:** **Office:** 435-722-1761 **Cell:** 435-828-0140
**Office hours:** Mondays, 4–5 p.m.

**Materials**

**Lab Notebook (required):** Lab Notebooks with carbon-copy or carbonless copy pages is essential. Recommended: *Organic Chemistry Lab Notebook* by Morton Publishing. ISBN-13: 978-1-61731-927-3.

Goggles, full-length pants, socks, and "complete" (closed-toed) shoes are required in the laboratory. (See **Safety** below.)

**Prerequisites:** Chem 1210 and Chem 1215

**Course Description:** This class focuses primarily on providing you with hands-on experience in basic organic chemistry lab techniques and instrumentation.

**Course Objectives:**

By the end of the semester you should:

1. Become proficient at using standard organic chemistry lab techniques*
2. Learn how to use standard analytical instrumentation, including IR and NMR*,†
3. Develop the ability to write lab reports using correct English and proper scientific style†

*IDEA objectives 1-2 †IDEA objective 4

(For more on using the IDEA course evaluation system, I've posted a document about the IDEA evaluations on Canvas.)

**Course Fees:** $75 lab fee for purchase of equipment and supplies

**Canvas:** Please logon to Canvas[1] regularly for announcements, assignments, grade postings, and alterations in the class and office hour schedules.

**Absences:** Attendance is mandatory. However, students *are* allowed one make-up lab per semester. Missing any additional labs thereafter will result in zeroes for those labs (keep in mind, though, that your lowest lab set score is dropped). **If you know ahead of time that you will miss a lab, and if the reason is valid (determined at the instructor's discretion), arrangements for a make-up lab will be made. No after-the-fact excuses/absences will be considered!** You must contact the instructor via email (m.christiansen@usu.edu) at least one week ***before*** an absence.

[1] https://login.usu.edu/cas/login?service=https%3A%2F%2Fmy.usu.edu%2Fpaf%2Fauthorize

**Grade Breakdown:**

| | | | |
|---|---|---|---|
| **Lab Safety Quiz** | | 20 points | (2.52%) |
| **Synthesis Report** | | 100 points | (12.58%) |
| **Lab Notebook Pages** | (25 points each – lowest score dropped) | 225 points | (28.3%) |
| **Lab Reports** | (50 points each – lowest score dropped) | 400 points | (50.31%) |
| **Instructor Evaluation** | | 50 points | (6.29%) |
| **Total** | | | **795 points** |

Final grades will be based upon the following scale, which is subject to modification:

A: 100-93% A–: 92-90% B+: 89-87% B: 86-83% B–: 82-80%
C+: 79-77% C: 76-73% C–: 72-70% D: 69-60% F: 59% and below

**Lab Safety Quiz:** We will take a Lab Safety Quiz on the first day of class. (See **Safety** below.)

**Synthesis Report:** 12.58 percent of your grade will come from a report you will write about a molecule from current literature that you would be interested in synthesizing. Written and video instructions on this are found on our Canvas homepage under the heading **Synthesis Report Slides and Video**.

**Lab Notebook Pages**: Proper notebook keeping is an indispensable part of research. It is so important, in fact, that in industrial labs, notebook pages are signed by the researcher and a colleague, who acts as a witness. The notebooks then serve as legal documents to establish claims of discovery. All work done in the lab must be summarized in your notebook. Your work and grade in the lab will be evaluated largely by the quality of your lab notebook.

Before coming to lab, you should write, on top of the first notebook page for each experiment, the **title of the experiment**, followed by a brief statement of the **experiment's purpose**. The following things should then be added thereafter:

1. (When applicable) The balanced chemical equation for the reaction or process you will perform
2. The experimental procedure for the lab in question, with enough detail so you can do the experiment without referring to your text
3. All entries in your notebook must be in black or blue ink. NO PENCIL!
4. Notebook entries must not be erased or obliterated. Cross out incorrect entries with a single line and make the correct entry nearby.
5. Data must be entered into your notebook directly as you gather it. Using scraps of paper for any records for later transfer to your notebooks is unacceptable.
6. Original notebook pages must not be removed.

**Lab Reports**: Your lab reports will be computer-generated documents. They must include:

1. The title of the experiment
2. A brief description (~ 50 words) of the experiment
3. A summary of the experimental procedures and results
4. All of the data collected and calculations performed
5. A concluding statement (what was learned from the results)
6. Late reports will be penalized by 10% for the first week, and an additional 10% for each subsequent week. I HIGHLY recommend you save all your graded work.
7. For additional questions about lab reports, please see the Sample Lab Report, Lab Rubric, and How to Write Lab Reports materials on our Canvas homepage.

**Instructor Evaluation:** At the end of the semester, I will evaluate your performance over the semester based on preparedness, adherence to safety rules, cooperativeness, and ability to work efficiently and independently.

**Safety:** Before starting lab experiments, all students must read and sign the Utah State University Safety Agreement,[2] which is part of our first-day **Lab Safety Quiz**. Students must attend the safety lecture held on the first day of lab to become familiar with the risks and safety procedures of the laboratory.

**General Guidelines:**

1. Individuals not wearing safety goggles, full-length pants, socks, and "complete" (closed-toed) shoes (thus, no flip flops, sandals, etc.) will not be allowed in the laboratory, no exceptions.
2. No shorts. Even capris are not recommended, due to the potential for skin damage.
3. Wear safety goggles at all times. Safety goggles are available in the laboratory. Contact lenses are not advised.
4. Avoid horseplay, goofing off, etc. Horseplay can easily result in an accident.
5. Do not talk on your cell phones during lab. If you must take a call, please do it in the hallway after notifying the instructor.
6. Listen to the instructions of laboratory staff.
7. No eating or drinking is allowed.
8. All waste chemicals must be placed in proper containers (usually in the hood).
9. Report all spills or accidents to your TA immediately for assistance.
10. A Lab coat or apron, other expendable clothing is a good idea. Don't wear your best clothing to lab. The university will not be liable for damaged clothing.
11. In order to be fair to all class members, TAs will not allow students to remain in the lab past the scheduled ending time.
12. All students must read and sign the Utah State University Chemistry and Biochemistry Departmental *Laboratory Safety Agreement* before beginning lab experiments.
13. Students must be registered for the lab section they attend. Failure to do so will result in an F letter grade being assigned to the university.

**COVID-19 Information –** Procedures for Working in the Laboratory During the Covid-19 Epidemic:

- Students will learn what section Cohort they are assigned to by reading the Cohort Assignment document on Canvas.
- Students will complete experiments during the time assigned to their Cohort.
- Students will enter the laboratory through the designated doors marked with clear signage.
- Students will exit the laboratory through the designated doors marked with clear signage.
- Students will wear face masks when entering the laboratory, working in the laboratory, and leaving the laboratory.
- Students will wash their hands when entering the laboratory and leaving the laboratory.
- Students will disinfect their work area before using the work area and after using the work area with provided disinfecting materials.
- Students will perform all work, including set-up, experiment performance, clean-up, and waste disposal, in their designated self-contained work areas.

[2] See Page 51 of the "Department Safety Manual," found at http://www.chem.usu.edu/safety/CAB-Safety%20Manual%20Final-2016.pdf.

# University Policies

**COVID-19 Classroom Safety.** While not mandated, USU encourages and welcomes the wearing of masks in all university buildings, especially within 6 feet of others. Furthermore, it is strongly encouraged to take measures to mitigate risk as recommended by federal and state public health officials. These measures include getting fully vaccinated, staying home if you are sick (even with mild symptoms), and maintaining good hygiene, including frequent hand washing. Testing will be provided, without charge, throughout the semester, and the USU COVID Webpage (https://www.usu.edu/covid-19/index) will provide up-to-date information. Please remember; COVID can have significant impact on the health and safety of those around you so remain vigilant and respectful.

**Academic Freedom and Professional Responsibilities.** Academic freedom is the right to teach, study, discuss, investigate, discover, create, and publish freely. Academic freedom protects the rights of faculty members in teaching and of students in learning. Freedom in research is fundamental to the advancement of truth. Faculty members are entitled to full freedom in teaching, research, and creative activities, subject to the limitations imposed by professional responsibility. USU Policy 403 (accessible at http://www.usu.edu/hr/files/uploads/Policies/403.pdf) further defines academic freedom and professional responsibilities.

**Academic Integrity – the "Honor System."** The University expects that students and faculty alike maintain the highest standards of academic honesty. The Code of Policies and Procedures for Students at Utah State University (accessible at https://studentconduct.usu.edu/studentcode) addresses academic integrity and honesty and notes the following:

- **Academic Integrity:** Students have a responsibility to promote academic integrity at the University by not participating in or facilitating others' participation in any act of academic dishonesty and by reporting all violations or suspected violations of the Academic Integrity Standard to their instructors.
- **The Honor Pledge:** To enhance the learning environment at Utah State University and to develop student academic integrity, each student agrees to the following Honor Pledge: "I pledge, on my honor, to conduct myself with the foremost level of academic integrity". Violations of the Academic Integrity Standard (academic violations) include, but are not limited to cheating, falsification, and plagiarism

**Plagiarism.** Plagiarism includes knowingly "representing by paraphrase or direct quotation, the published or unpublished work of another person as one's own in any academic exercise or activity without full and clear acknowledgment. It also includes the unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials." The penalties for plagiarism are severe. They include warning or reprimand, grade adjustment, probation, suspension, expulsion, withholding of transcripts, denial or revocation of degrees, and referral to psychological counseling.

**Course Fees:** $75 lab fee for purchase of equipment and supplies.

**Grievance Process.** Students who feel they have been unfairly treated [in matters other than discipline, admission, residency, employment, traffic, and parking - which are addressed by procedures separate and independent from the Student Code] may file a grievance through the channels and procedures described in the Student Code: https://studentconduct.usu.edu/studentcode/article7.

**Sexual Harassment.** Utah State University is committed to creating and maintaining an environment free from acts of sexual misconduct and discrimination and to fostering respect and dignity for all members of the USU community. Title IX and USU Policy 339 (https://www.usu.edu/policies/339) address sexual harassment in the workplace and academic setting.

The university responds promptly upon learning of any form of possible discrimination or sexual misconduct. Any individual may contact USU's Affirmative Action/Equal Opportunity (AA/EO) Office (http://aaeo.usu.edu/) for available options and resources or clarification. The university has established a complaint procedure to handle all types of discrimination complaints, including sexual harassment (USU Policy 305, https://www.usu.edu/policies/305/), and has designated the AA/EO Director/Title IX Coordinator as the official responsible for receiving and investigating complaints of sexual harassment.

**Students with Disabilities.** USU welcomes students with disabilities. If you have, or suspect you may have, a physical, mental health, or learning disability that may require accommodations in this course, please contact the Disability Resource Center (DRC) as early in the semester as possible (University Inn # 101, 435-797-2444, drc@usu.edu). All disability related accommodations must be approved by the DRC. Once approved, the DRC will coordinate with faculty to provide accommodations.

**Withdrawal Policy and "I" Grade Policy.** If a student does not attend a class during the first week of the term or by the second class meeting, whichever comes first, the instructor may submit a request to have the student dropped from the course. (This does not remove responsibility from the student to drop courses which they do not plan to attend.) Students who are dropped from courses will be notified by the Registrar's Office through their preferred e-mail account.

Students may drop courses without notation on the permanent record through the first 20 percent of the class. If a student drops a course following the first 20 percent of the class, a W will be permanently affixed to the student's record (check General Catalog for exact dates). Students with extenuating circumstances should refer to the policy regarding Complete Withdrawal from the University and the Incomplete (I) Grade policy in the General Catalog.

**No-Test Days Policy.** For classes that meet for a full semester, a five-day period designated as "no-test" days precedes final examinations. During this time, no major examinations, including final examinations will be given in order that students may concentrate on classwork, the completion of special assignments, writing projects, and other preparation for duly scheduled final examinations. Approved exceptions include final papers, weekly chapter quizzes, quizzes, projects, and examinations associated with a lab that does not meet during final examinations. This policy does not apply to classes that meet only during the second 7-week session of the semester or to classes offered during the summer term. Complete information related to Final Examination Policies (https://catalog.usu.edu/content.php?catoid=12&navoid=3311) can be reviewed in the General Catalog.

**Assumption of Risk.** All classes, programs, and extracurricular activities within the University involve some risk, and some involve travel. The University provides opportunities to participate in these programs on a voluntary basis. Therefore, students should not participate in them if they do not care to assume the risks. Students can ask the respective program leaders/sponsors about the possible risks a program may generate, and if students are not willing to assume the risks, they should not select that program. By voluntarily participating in classes, programs, and extracurricular activities, students do so at their own risk. General information about University Risk Management policies, insurance coverage, vehicle use policies, and risk management forms can be found at http://www.usu.edu/riskmgt/.

**Mental Health.** Mental health is critically important for the success of USU students. As a student, you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce your ability to participate in daily activities. Utah State University provides free services for students to assist them with addressing these and other concerns. You can learn more about the broad range of confidential mental health services available on campus at Counseling and Psychological Services (CAPS).

Students are also encouraged to download the "SafeUT App" to their smartphones. The SafeUT application is a 24/7 statewide crisis text and tip service that provides real-time crisis intervention to students through texting and a confidential tip program that can help anyone with emotional crises, bullying, relationship problems, mental health, or suicide related issues.

**I have read and understood the course syllabus:**

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**Printed Name** **Signature** **Date**