

## CHEM 2325 Tentative Schedule – Spring 2022

(Subject to moderate change)

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

**Lab Fees.** The course lab fee of \$100 is used to purchase supplies, consumables, repair and replace equipment.

Lab	Experiment	Assignments
0	1/10 Course Policies, <b>First-Day Safety Quiz</b> <b>Group Discussion:</b> last semester's synthesis assignment <b>Lecture:</b> Designing a total synthesis	<b>Synthesis Assignment given:</b> Design a total synthesis of our chosen target molecule (due 2/24)
<b>1/17 – NO CLASS – Martin Luther King, Jr. Day</b>		
1	1/24 *Unknown Problem Set – Mass Spectrometry, IR, and NMR spectroscopy	Nothing
2	1/31 *Investigating GC	<b>Lab #1 Report due</b> at the start of class
3	2/7 *Column Chromatography	<b>Lab #2 Report due</b> at the start of class <b>Lab #3 notebook pages due</b> at the end of class
4	2/14 *Synthesis of Aspirin	<b>Lab #3 Report due</b> at the start of class <b>Lab #4 notebook pages due</b> at the end of class
	<b>2/21 – NO CLASS – President's Day</b>	
	2/28 Weigh and obtain m.p. for aspirin Turn in and discuss <b>Synthesis Assignment</b>	<b>Synthesis Assignment due</b> at the end of class (100 points)
<b>3/7 – NO CLASS – Spring Break</b>		
5	3/14 Aldol Condensation	<b>Lab #4 Report due</b> at the start of class <b>Lab #5 notebook pages due</b> at the end of class
6	3/21 Reducing Sugars	<b>Lab #5 Report due</b> at the start of class <b>Lab #6 notebook pages due</b> at the end of class
7	3/28 Experiment: <u>Conduct Step 1</u> of our total synthesis <sup>†</sup>	<b>Lab #6 Report due</b> at the start of class <b>Step 1 notebook pages due</b> at the end of class (50 points)
8	4/4 Experiment: <u>Conduct Step 2</u> of our total synthesis <sup>†</sup>	<b>Step 2 notebook pages due</b> at the end of class (50 points) <b>Exit Survey on Canvas due by 4/18</b>
9	4/11 Experiment: <u>Conduct Step 3</u> of our total synthesis <sup>†</sup>	<b>Step 3 notebook pages due</b> at the end of class (50 points)
10	4/18 Experiment: <u>Conduct Step 4</u> of our total synthesis <sup>†</sup>	<b>Step 4 notebook pages due</b> at the end of class (50 points)

\*These experiments are available at <http://ion.chem.usu.edu/~harrisd/Courses/2325/CHEM%202325.html>. The password for these is **goggles4u**.

<sup>†</sup> Students will obtain experimental procedures from the literature, as explained in lecture on February 28<sup>th</sup>.

**CHEMISTRY 2325 – Spring 2022**  
**Organic Chemistry Lab II**  
**Mondays, 5:00 – 7:50 p.m., Bingham Building Room 132**

**General Information**

**Instructor:** Dr. Mike Christiansen (please just call me Mike)  
**Email:** [m.christiansen@usu.edu](mailto:m.christiansen@usu.edu) (please do NOT message me through Canvas; I don't check it)  
**Office:** 221G Bingham Building  
**Phone:** **Office:** 435-722-1761      **Cell:** 435-828-0140  
**Office hours:** Mondays, 4–5 p.m.

**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 2315

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

**Course Structure:** In accordance with the American Chemical Society's certification requirements, this course will “include synthesis of molecules; measurement of chemical properties, structures, and phenomena; [and] hands-on experience with modern instrumentation”.<sup>1</sup> The format will be very similar to that of CHEM 2315, with the following modifications:

1. A four-week “synthesis project,” designed by students and led by the instructor, will be carried out according to the description below and schedule above.
2. Point values for day-end lab notebook pages and lab reports have been slightly altered (see below).

**Course Objectives:**

By the end of the semester you be able to:

1. Carry out standard organic chemistry lab operations (extraction, filtration, recrystallization, column chromatography, distillation, etc.).\*
2. Characterize compounds using standard analytical techniques (TLC, melting point determination, IR and NMR spectroscopy, etc.).\*
3. Write coherent scientific reports using correct English and ACS writing style.<sup>†</sup>
4. Use SciFinder Scholar to find specific reaction conditions in current literature.<sup>‡,\*</sup>
5. Choose, design, and carry out a synthetic project as a team.<sup>‡,\*</sup>

\*IDEA objective 4      †IDEA objective 8      ‡IDEA objective 9      ‡IDEA objectives 3, 5

(For more on using the new IDEA course evaluation system, please see the IDEA tutorial I've posted on Canvas.)

**Canvas:** Please logon to Canvas<sup>1</sup> 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](mailto:m.christiansen@usu.edu)) at least one week **before** an absence.

#### Grade Breakdown:

<b>Lab Safety Quiz</b>		20 points (3.1%)
<b>Synthesis Assignment</b>		100 points (15.5%)
<b>4 Lab Notebook Pages</b>	(25 points each – lowest score dropped)	75 points (11.6%)
<b>6 Lab Reports</b>	(50 points each – lowest score dropped)	250 points (38.8%)
<b>4 Special Lab Notebook Pages</b>		200 points (31.0%)
<b>Total</b>		<b>645 points</b>

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

\*The instructor will evaluate your performance over the entire semester based on your preparedness, adherence to safety rules, cooperativeness, and ability to work efficiently and independently.

#### Your Grade:

Your grade stems from five components: (1) a first-day **Lab Safety Quiz**; (2) a **Synthesis Assignment**; (3) **lab notebook pages**, (4) **lab reports**, and (5) **special lab notebook pages** for our synthesis project. Grading will reflect completeness, accuracy, and adherence to procedure, as well as demonstration of good writing skills. To help you with your notebook pages and reports, please read the following:

#### Lab Notebooks 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** and the **experiment's purpose**. The following things should then be added thereafter:

1. The balanced chemical equation for the reaction or process you will perform
2. The experimental procedure for the lab in question, with sufficient detail so you can do the experiment without referring to your textbook

You will turn in the carbon copy of your notebook pages, signed and dated, at the end of each lab period.

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

### Further info

1. All entries in your notebook must be in black or blue ink. NO PENCIL!
2. Notebook entries must not be erased or obliterated. Cross out incorrect entries with a single line and make the correct entry nearby.
3. 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.
4. 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. The balanced chemical equation, drawn using ChemSketch or other suitable software
4. A summary of the experimental procedures and results
5. All of the data collected and calculations performed
6. A concluding statement (what was learned from the results)

You will also be assigned **some additional problems or questions**, to be answered at the end of some of your lab reports. Late reports will be penalized by 10% if not handed in on time and an additional 10% penalty for each week after that. **I also HIGHLY recommend that you keep all your graded work.**

For additional questions about lab reports, please see the **Lab Report Rubric**, **Lab Report PowerPoint Presentations**, and **Sample Lab Report** that I've posted on Canvas.

### Special Lab Notebook Pages for our Synthesis Project

Thirty-one percent of your grade will arise from selecting, designing, and carrying out a short total synthesis. This will be done in teams, under the lab instructor's supervision. Pertinent instructions and grade explanations will be delivered during in-class lectures, given according to the *class schedule*.

**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 beginning lab experiments, all students must read and sign the Utah State University Safety Agreement (available on page 51 of the "Department Safety Manual," found at <http://www.chem.usu.edu/htm/facilities/safety-policies>). Students must also 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. NO CONTACTS. Most contacts trap chemicals between the surface of the eye and the lens, increasing the possibility of injury in case of a chemical spill. Also, vapors from experiments can be trapped behind the lens.
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.

### **General Guidelines (continued)**

6. Listen to the instructions of laboratory staff.
7. Eye protection (glasses or safety goggles - no contact lenses) is required at all times. Safety goggles are available in the laboratory.
8. No eating or drinking is allowed.
9. All waste chemicals must be placed in proper containers (usually in the hood).
10. Report all spills or accidents to your TA immediately for assistance.
11. 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.
12. In order to be fair to all class members, TAs will not allow students to remain in the lab past the scheduled ending time.

### **Statewide Mentoring Program**

For students at any of our statewide campuses (not available in Logan yet, so sorry!), I encourage you to consider signing up for our USU Statewide Faculty-to-Student Mentoring Program. The purpose of this program is to help students to: (1) successfully adjust to university life; (2) realize they are valued members of the university; (3) have a clear sense of purpose; and (4) achieve their educational goals. If you sign up, then you will be assigned a faculty member, who will help provide academic support, career guidance, and psychosocial support. If you sign up, you will also have the opportunity to participate in a voluntary research study, whose purpose is to evaluate if the program's effectiveness. The total time commitment is between 2 and 5 hours per semester for as long as you are enrolled in the program. To learn more, please visit <https://statewide.usu.edu/mentor>. To sign up, please go to [https://usu.co1.qualtrics.com/jfe/form/SV\\_eQdWbzozv34udr7](https://usu.co1.qualtrics.com/jfe/form/SV_eQdWbzozv34udr7).

### **University Policies**

**COVID-19 Classroom Safety Protocols:** While not mandated, USU encourages and welcomes the wearing of masks in all university building, 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 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 (<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 (Student Conduct) 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.

**Discrimination and Sexual Misconduct:** USU strives to provide an environment for students and employees that is free from discrimination and sexual misconduct. If you experience sexual misconduct or discrimination at any point during the semester inside or outside of class, you are encouraged to contact the USU Title IX Coordinator via Old Main room 161 in Logan, 435-797-1266, [titleix@usu.edu](mailto:titleix@usu.edu), or at [equity.usu.edu/report](http://equity.usu.edu/report). You can learn more about the USU resources available for individuals who have experienced sexual misconduct at [sexualrespect.usu.edu](http://sexualrespect.usu.edu). Resources for individuals who have experienced discrimination are listed at [equity.usu.edu](http://equity.usu.edu).

**Required Reporting of Sexual Misconduct:** The instructor is designated by USU as a "reporting employee." This means that if you share information about sexual misconduct (sexual harassment, sexual assault, relationship violence, or sex-based stalking) with the instructor, they will report that information to the USU Title IX Coordinator. The instructor is also required to tell you about designated confidential resources, supportive measures, and how you can file a report with the USU Title IX Coordinator.

**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](mailto: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, <https://counseling.usu.edu/>).

Students are also encouraged to download the “SafeUT App” (<https://healthcare.utah.edu/uni/programs/safe-ut-smartphone-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**