

CHEM 1215 Tentative Schedule – Fall 2021

(Subject to moderate change)

Labs held on Tuesdays, 8:00 – 10:50 p.m., Bingham Building Room B134

	Experiment	Pre-Lab Review Questions (due at the start of class)	Lab Report Questions (due with Lab Reports)
	8/31 Course Policies, Safety Contracts/Quiz, Lab Drawer Check-In	None	None
1	9/7 Basic Lab Techniques (page 1)	2, 3, 8, 10, and 11 (pp. 13 and 14)	1-4 (p. 17)
2	9/14 Separation of the Components of a Mixture (page 21)	1, 2, 5 (p. 28)	1, 2, 3, 5 (p. 32)
3	9/21 *Chemical Reactions – “A Greener Approach”	None	None
4	9/28 Chemical Formulas (page 33)	1, 4, 6, 7 (p. 43-44)	1-4 (p. 47)
5	10/5 Chemical Reactions of Cu and % Yield (page 49)	1, 2, 3, 4, 5 (p. 54-55)	1, 4, 5, 6 (pp. 58-59)
6	10/12 Gravimetric Analysis of a Chloride Salt (page 61) REPORT DUE ON 10/26/2021	1, 2, 3, 4, 5 (p. 70-71)	1, 2, 5, 6 (pp. 74-75)
7	10/19 *Paper Chromatography REPORT DUE ON 10/26/2021	1-3	1-3
8	10/26 Heats of Neutralization (page 77)	1, 2, 3, 4, 5 (p. 84-85)	1-4 (p. 89)
9	11/2 Atomic Spectra and Atomic Structure (posted on Canvas homepage)	None	None
10	11/9 Behavior of Gases: Molar Mass of a Vapor (page 93?)	1, 2, 3, 4 (p. 121-123)	1 and 3 (p. 127) Gas Law Problems: 3, 7, 8 (pp. 128-129)

*These experiments are not in your book, but are available online at:

<http://ion.chem.usu.edu/~harrisd/Classes/1215/CHEM%201215.html>

The password for these is **goggles4u**.

CHEMISTRY 1215 – Fall 2021
Chemical Principles Laboratory I
Tuesdays, 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: Tuesdays, 4–5 p.m.

Materials **Lab Text (required):** *Catalyst: The Pearson Custom Library for Chemistry*, by Harris:
ISBN-13: 978-1256006725

Lab Notebook (required): Lab Notebooks are available at the USU bookstore (carbon-copy pages are absolutely necessary). ISBN-13: 978-1269281775

Splash Goggles, lab coat, full-length pants, socks, and “complete” (closed-toed) shoes are required in the laboratory. (See the “safety” section below.)

Prerequisites: Chem 1210 (may be taken concurrently)

Course Description: This class focuses primarily on providing you with hands-on experience in basic lab techniques and instrumentation, complementary to the topics covered in CHEM 1210. In this lab, students will learn about data assessment, synthesis, determination of chemical composition and characteristics, chemical separations, and the characterization of reactions.

Course Objectives:

By the end of the semester you should:

1. Become proficient at basic chemistry lab techniques*[†]
2. Learn how to use basic analytical instrumentation*[†]
3. Improve your ability to properly, thoroughly, and neatly document lab work[†]

*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 Canvas¹ regularly for announcements, assignments, grade postings, and alterations in the class and office hour schedules.

Attendance: Attendance is mandatory. However, in extenuating circumstances (such as a COVID infection), I *will* provide some means (TBD) of doing the work outside of class, on an as-needed basis. Please email me (m.christiansen@usu.edu) if and when that applies to you. Please remember that your lowest lab set score is dropped.

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

Grade Breakdown:

Lab Safety Quiz		20 points (~2%)
Pre-Lab Review Questions	(best 7 of 8, counted at 10 points each)	70 points (~7%)
Lab Notebook Pages	(best 9 of 10, counted at 10 points each)	90 points (~9%)
Lab Reports	(best 9 of 10, counted at 80 points each)	720 points (73%)
Instructor Evaluation*		80 points (~8%)
Total		980 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.)

Pre-Lab Review Questions: Before starting each lab, you are required to hand in the answers to the lab's **Review Questions**, according to our Class Schedule. Each experiment's **Review Questions** section is found at the end of the experiment, in our lab text. The purpose of doing these **Review Questions** is to ensure that read and understand each lab, before beginning.

Lab Notebook Pages: You will turn in carbon-copies of your lab notebook pages, **which must be signed and dated**, at the end of each class period. (See **Lab Notebooks** below.)

Lab Reports: Lab reports for each lab are due at the beginning of the next lab period. (See **Lab Reports** below.)

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.

Lab Notebooks: 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 are the **Report Forms** found at the end of each experiment, in your text. These are due one week *after* conducting the lab. At the end of each **Report Form**, you'll find a **Questions** section. When handing in your lab report, in addition to filling in all the required blanks, you must also include your answers to the lab's **Questions**. (You only have to do the **Questions** listed in our **Class Schedule**.) Late reports will be penalized by 10% for the first week, and an additional 10% for each subsequent week. **I HIGHLY recommend that you save all your graded work.**

Safety: The USU Chemistry and Biochemistry Department is committed to providing a safe and healthy environment for students, staff and faculty, as well as teaching appropriate respect for safety while engaged in scientific pursuits. Personal safety of each individual associated with the department is of primary importance. Through the department faculty and the department Safety Committee, every effort is made to ensure the availability and maintenance of all physical, chemical, biological, mechanical, radiological facilities, and equipment required for safety as per federal, state, local, and University policy.

- **Eye protection** – Goggles or safety glasses are required when working in the laboratory. Specific requirements may be found in the safety documentation of each laboratory.
- **Lab coat** – Lab coats are required when working in the laboratory.
- **Gloves** – Proper gloves are required when working in the laboratory. Check the compatibility of the gloves with the chemicals to be used. Take off the gloves before stepping out of the lab.
- **Safety equipment** – Know the locations of a fire extinguisher, eye-washer, safety shower, first aid box and chemical spill.
- **Food and drinks** – Food and drinks are not allowed in the laboratory. Food and drink containers must be disposed of outside the laboratory.
- **Shoes** – Shoes should cover the entire foot. Sandals, clogs, and other open toed or open-heeled shoes do not cover enough foot and are not allowed.
- **Hair** – Hair should not be worn in a style that impairs vision, cause distractions during job functions, or that may come in contact with work surfaces or moving equipment.
- **Transfer of chemicals** – For transporting chemicals outside the laboratory, place the chemicals in a secondary confinement and transport the chemicals on a cart. Alternatively, hand-carrying chemicals in a secondary confinement is acceptable. However, hand-carrying chemicals directly, without using a secondary confinement, outside the laboratory is forbidden. For transporting chemicals within the laboratory, always wear personal protective equipment including gloves, goggles and lab coat and carry the chemicals with caution. Never grab the container by the cap. Return the chemical to its designated storage site after use.
- **Fume hood** – Always make sure the fume hood is operational before use. Open the sash to proper height when operating a procedure. Avoid opening the sash too high, which may reduce the effectiveness of air flow. Avoid over accumulation of items in the fume hood that may obstruct the air flow. Lower the sash when the operation is complete.
- **Emergency exit** – Exits and aisles must not be obstructed by equipment, chairs, supplies, or trash. Doors to the laboratory must be kept closed, exit doors must not be blocked, locked, or obstructed in any way to inhibit egress.
- **Glassware** – Glassware must be cleaned after completion of the experiment. Large pieces of broken glass must be placed in the broken glass containers designated for large pieces of broken glass.
- **Chemical spills** – You must know the location of spill clean-up material in your laboratory. You must know the Spill Prevention and Response procedure for your laboratory.
- **Housekeeping** – Good housekeeping is an essential aspect of laboratory safety. The work area must be cleaned up at the end of each procedure and prior to the start of a new procedure.
- **Teaching Labs** – Students enrolled in laboratory courses in the Department of Chemistry & Biochemistry, as well as the teaching assistants assigned to these courses, are required to follow the general safety requirements listed above as well as any course specific guidelines and required documentation.

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.

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 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:

Printed Name

Signature

Date