De Anza College-Spring 2024 (4/7-6/27)

Chemistry 1C - General Chemistry III

CHEM 1C - Section 25
Lab MW – 11:30AM to 2:20PM – SC2208
Lecture TR – 4:30PM to 5:45PM – FOR1

CHEM 1C - Section 26
Lab TR – 11:30AM to 2:20PM – SC2208
Lecture TR – 4:30PM to 5:45PM – FOR1

Instructor: Dr. Chris Deming, email: demingchristopher@fhda.edu

Office Hours: Mondays 10:30 AM – 11:30 AM SC1226, Wednesday 10:00 AM – 11:00 AM Physical Sciences and Technology Village Room S55, Thursdays 10:30 AM – 11:00 AM Physical Sciences and Technology Village Room S55, Thursdays 2:45 PM – 4:15 PM SC1226.

Course Description: This class will cover the principles of solutions, buffers, electrochemistry, transition metals, and nuclear chemistry.

This course is divided into two separate instructional periods, the lecture and laboratory sections. The lecture portion is primarily devoted to the material discussion while the laboratory portion gives a chance for chemical experimentation. One registration code will enroll for the lecture and lab sections. Lecture and lab sections must be taken together to pass Chem 1C and will both go towards a single grade.

Course Material:

1. **Primary Lecture Text/Homework**: *Chemistry: A Molecular Approach,* Tro, 6th edition eText + Mastering Chemistry. This is a quality text with emphasis on clarity and student learning. Mastering Chemistry is an online platform we will use for the class homework and comes with an electronic version of the text. There are a few options for acquiring these materials

   a. 14-week direct purchase price when registering with Pearson - $40.00

   b. 14-week net price to the bookstore for an access code - $35.00 (final price to student will be determined by their margin) ISBN: 9780135402306

   c. 24-month direct purchase price - $105.00 (final price to student will be higher if purchasing through the bookstore)

I will further discuss how to subscribe to and utilize the platform on the first day of class. **NOTE**: If you use a physical textbook, you will still need to get a subscription to Mastering Chemistry for the class homework, but do not need to get a 6th edition textbook.

2. Supplementary Lecture Text: OPEN STAX Chemistry, Second Edition. This is a free, online textbook and we will follow chapters 11, 14, 15, 17, 19, and 21 in this course.

3. Supplementary Calculation Practice: Calculations in Chemistry. While homework problems will be assigned through Mastering Chemistry and sometimes extra worksheets, more practice is always a good idea, and this book can give just that. It can be found as a hard copy or digital through the De Anza bookstore.

4. Lab Equipment: There are a few things needed to safely complete the experiments.

a. Goggles are required for the entire lab (in addition to appropriate clothing for lab work, such as long pants and closed-toe shoes). The specifics of all the required safety gear will be discussed on the first day of lab and are described more in the lab safety sheet at the end of the syllabus, but goggles are the only required item beyond regular clothing you will need for lab work. Safety goggles must include a flex seal and indirect venting, and carry ANSI Z87.1+ and CSA Z94.3 certifications.

b. A lab notebook will also be needed. This notebook cannot be pocket size and must be permanently bound, so no recording information on lose papers. Other than that, the type doesn't matter, and digital notebooks are okay as well. Please note that electronic devices won't be permitted for referencing notes during the lab final, so such work will need to be printed out. We will have time the last week of class to use the lab printer if needed.

5. Scientific Calculator. Logarithm and exponential functions required. You are encouraged to bring your calculator each day to work through examples as they are presented. Phones will not be allowed for calculations during tests.

6. Camera linked to the internet – For much of your classwork, you will need to take a picture of your work and submit to CANVAS. Phones are 100% okay. Please let me know if this is an issue as soon as possible.

Class Registration. Registration limit is strictly set at 30 per section since we are limited by the space in lab. The class will be filled based on the official roster provided by the De Anza Admissions and Records, including an official waitlist. Students on this waitlist may attend the lecture within the first two weeks but will not be allowed to come to lab until officially enrolled

due to space restrictions. Since those on the waitlist will not be able to access the class canvas page, I will email lecture slides and assignments until registration is finalized at the end of the second week.

Resources: Academic support can be found at the Learning Resources Division https://www.deanza.edu/learningresources/. Information about tutoring can be found at the Math Science and Technology Resource Center https://www.deanza.edu/studentsuccess/mstrc/.

Academic Integrity: By enrolling in classes at De Anza College, you are agreeing to the academic integrity policy and are held to all standards. Specifics can be found at https://www.deanza.edu/studenthandbook/academic-integrity.html.

Cheating during an exam/quiz or copying/using work other than your own for assignments will result in a 0 for the entire assignment, regardless of what percentage of the work is from cheating.

Worse than a 0 on an exam, I am required to report such incidents to the disciplinary committee, who will make a note of the incident on your transcript, which then becomes visible to 4 year colleges upon reviewing your transfer application.

Disability Service Support: De Anza is committed to providing support for all students. Please contact me as soon as possible if you would like to use any accommodations and I will be happy to do what I can to help. For more information, visit Disability Service Support at https://www.deanza.edu/dss/

Classroom Conduct: I want to be very clear that this class is a place where everyone can feel safe to be themselves and to learn at their own pace. It is important to me that you feel comfortable to ask questions, and I hope you all will help me create a supportive atmosphere.

Late Work Policy. Late prelabs are not accepted since preparation for safe lab work is mandatory. Other late work is accepted, but once an assignment has been graded, submissions of that assignment will be worth half credit maximum. If you anticipate not meeting a deadline for an assignment, please contact me and we can work together to make an alternate schedule.

Course Schedule. All exam dates, lecture topics/dates, lab topics/dates are listed on page 10. The final exam date is provided on page 10 and can also be found on the de Anza website.

Class Assignments:

Lecture Assignment	Points	Percent
Student Welcome Questionnaire	5.0	0.6
CHEM 1A/1B Review Sheet	5.0	0.6
Homework	60.0	6.7
Quiz 1	25.0	2.8
Quiz 2	25.0	2.8
Quiz 3	25.0	2.8
Exam 1	100.0	11.1
Exam 2	100.0	11.1
Final Exam	120.0	13.3
Lecture Total	**465.0**	**65.2**

Class Total	**713.0**	**100.0**

Lab Assignment	Points	Percent
Chemical Lab Safety Sheet	3.0	0.3
Chemical Safety Quiz	5.0	0.6
pKa of an Indicator Prelab	5.0	0.6
pKa of an Indicator Lab Quiz	3.0	0.3
pKa of an Indicator Experimental Data	4.0	0.4
pKa of an Indicator Worksheet	5.0	0.6
Buffers Prelab	3.0	0.3
Buffers Lab Quiz	4.0	0.4
Buffers Experimental Data	5.0	0.6
Buffers Worksheet	5.0	0.6
Freezing Point Depression Prelab	5.0	0.6
Freezing Point Depression Lab Quiz	3.0	0.3
Freezing Point Depression Experimental Data	4.0	0.4
Freezing Point Depression Worksheet	5.0	0.6
Common Ion Prelab	5.0	0.6
Common Ion Lab Quiz	3.0	0.3
Common Ion Experimental Data	4.0	0.4
Common Ion Worksheet	5.0	0.6
Anions Prelab	5.0	0.6
Anions Lab Quiz	3.0	0.3
Anions Worksheet	5.0	0.6
Electrochemistry Prelab	5.0	0.6
Electrochemistry Lab Quiz	3.0	0.3
Electrochemistry Formal Lab Report	30.0	3.3
Green Crystals Revisit Worksheet	8.0	0.9
Cations Prelab	5.0	0.6
Cations Lab Quiz	3.0	0.3
Cations Worksheet	5.0	0.6
Lab Final	100.0	11.1
Lab Total	**248.0**	**34.8**

Lecture

Lecture Description

This class will cover chapters 14, 18, 20, 21, and 26 from the assigned textbook. All lectures will be held in person from 4:30 PM to 5:45 PM on Tuesdays and Thursdays in room FOR1. The power point lecture slides will be posted before the lecture on CANVAS under files.

My general philosophy toward lecture is that I am looking to give a deep description of the concepts as well as a thorough review of the associated mathematics. The marriage of these two independent ways of understanding is ultimate goal. This means I will spend a significant amount of time in lecture describing the atomic scale dynamics as well as going over calculations.

Below are some helpful tips that make learning much easier this quarter.

1. Review the material *before* attending the lecture. This review could include reading the section in the textbook, reviewing the lecture slides, or even glancing at the homework. This preview will help you develop a stronger and more personal connection to the topics and make the presented material easier to understand.

2. Don't only copy the words from the slides during lecture. Since I will post pdfs of the lecture slides before the lecture, you will not need to copy down everything on the presentation. Many of the slides are very dense with info, and it would take you too much time to copy all the words down.

Furiously copying the words on slides is not the best way to learn during a lecture, so instead, writing down what I am saying and/or what you are thinking will be a much more successful method.

This can be done with a tablet, printing out the slides before, or writing in a notebook using the slide numbers.

3. Complete all homework problems. Extensive practice is the best way to ensure concept mastery. The more you practice, the more comfortable you will be, and the better you will perform on exams. Beyond the minimum of the assigned problems, you are encouraged to use the calculation text book and do any the extra problems sets. I am serious when I say that I sometimes use homework questions on exams.

4. Don't fall behind. In chemistry, each new topic will build on the previous one so it is essential to understand the topics as they are presented. Following a lecture when you do not understand the previous material is not an effective method for learning and will lead to further problems. To avoid falling behind……

5. Get help when you need it. If you are having a difficult time with a topic, it is your responsibility to get help. There are plenty of resources, including myself, for aiding in material comprehension. You are also encouraged to find a study group and/or come to office hours.

Lecture Assignments

Student Welcome Questionnaire. To become better acquainted with you and provide the best overall instructions possible, I have created a set of questions for you to answer, worth **5 points.** My idea is that with a strong relationship and mutual respect, communication and thus learning will be facilitated. I hope that knowing some of this info early on will help start building this relationship. The assignment will become available right when the canvas site opens. When you click on that assignment, you will find a pdf with the questions and further instructions.

CHEM 1A/1B Review Sheet. To get a feeling of how comfortable you are with the prerequisite material, and to give you an idea of what concepts we will build upon in this class, there will be a worksheet worth **5 points** that I will discuss during the first week of class. The goal for this assignment is not to take away points but rather to give a true assessment of your starting point so I can better teach as we go through the new chapters this quarter.

Homework. Homework assignments are given through the online platform Mastering Chemistry. Scoring is on accuracy and overall completion. I will discuss how to subscribe to and utilize this platform on the first day of class.

Doing all the listed problems is highly recommended and represents the minimum needed to practice the topics. You are strongly encouraged to complete additional practice problems throughout the textbook and/or supplementary text.

Lecture Quizzes. Quizzes will be given between the exams to make sure everyone is keeping up with the material throughout the quarter. The quizzes are worth **25 points** each, will take about 25 minutes, and will be given during the beginning of the lecture. The days of the quizzes are given on page 10 and reminders will be sent through email

Lecture Exams. There will be two lecture exams throughout the quarter. Exams will cover material from lectures, homework, and book chapters. If you are having difficulty completing the homework questions for that chapter, you are urged to get help *before* taking the test. Questions will range from easy to difficult and may require solving problems that have not been explicitly demonstrated before. I will post a study topic guide before each exam.

Each exam is worth **100 points,** and the dates are given on page 10. No late or early exams will be administered. If you feel the grading of any exam is incorrect, please let me know because I am happy to talk about it with you. I will release a key after the exam, and I am very open to hearing what you have to say about the grading, but you must do so within **one week** of the day the exam key is released.

Lecture Final. The lecture final is worth **120 points** and will only cover all chapters and topics that have not been on the other lecture exams. The date and time for the final are given on page 10 and will not change.

Laboratory

While lab work is very exciting, it is important to be clear about the proper precautions for chemical hazards and how to complete lab assignments.

The chemical safety document can be found on the last page of the syllabus. I will go over this sheet in lab and you will read, sign, and turn it in to the CANVAS assignment before performing any experiments, worth **3 points**.

Additionally, there are online lab safety videos and a corresponding quiz that must be completed with 100% before any lab work can be performed. I will talk about this on the first day of class and completion of this quiz is worth **5 points.**

What follows below are descriptions of the policies and assignments required for each experiment.

Late/Tardy Policy

Arriving late to lab more than two times during the quarter will result in a **loss of 2 points per tardy** beyond the first two. If you miss the entire lab intro you will not be allowed to perform the experiment that day since I will not be able to redo the intro while still watching over the class during the experiment and you will not receive points for that experiment. Hearing *all* the safety protocols for the lab at the beginning of the lab period, especially for the labs in 1C, is crucial for safe experimentation, and my hope is this policy will encourage timely attendance.

Absence Policy

If you are feeling sick before coming to lab, please, stay home. While you cannot make up the experiment due to time restrictions, there will be a way for you to make up the points so you won't lose any for staying home. We are all counting on each other to make responsible decisions and I don't want you coming to lab in fear of losing points if you are not well enough to do so. Just please let me know as soon as you can.

Lab Assignments

There are a total of 7 experiments this quarter that will loosely correspond to the topics we are covering in lecture. Below you will find instructions on how to complete each lab

Step 1: The first thing to do to prepare for the lab is to *read the entire experiment*. It is essential to become familiar with the experimental design and procedures before starting with the lab work, and this starts with a thorough read-through of the lab manual. These lab manuals are available as pdfs on CANVAS under "files" as well as attached to the prelab assignments.

Step 2: Once you have familiarized yourself with the lab, the next step is to write a **prelab worth 5 points**. There are three parts to the prelab that are equally important.

The first part of the prelab is the **lab introduction**, where you will describe the goals of the experiment, introduce the scientific principles that form the basis of the study, and

summarize the process by which you obtain the experimental data. This should not be a list of procedural steps but rather 1-3 paragraphs of writing in your own words.

The second part is a recognition of the **hazards** associated with each chemical in the procedure. This does not need to be everything on the SDS but should convey the hazards of working with that chemical and the proper precautions for safe usage.

The third part of the prelab is to write **tables** to hold the data you will collect. These can't be print outs of tables from the lab manual but should be something you make after reading the procedure and envisioning the data collection.

All parts of the prelab must be completed before coming to lab. Scan/take pictures of the work and upload them to the appropriate CANVAS assignment before the start time of the lab. Late prelabs are not accepted.

Step 3: At the *beginning* of the lab period, for the first day of each experiment, there will be a quiz to test how well the experimental design and procedural steps are understood, worth **3 points**. These will only take about 10 minutes, and you can reference your prelab and lab notebook during the quiz.

Step 4: After the quiz, I will give an introduction at the beginning of the lab session that will typically include a discussion of the theory behind the experiment as well as a walkthrough of the harder aspects of the procedure. If you miss the entire lab intro you will not be allowed to perform the experiment that day since I will not be able to redo the intro while still watching over the class during the experiment and you will not receive points for that experiment.

Step 5: After performing the experiment, take a picture of your data (in the tables you made for the prelab) and load it to the appropriate assignment before leaving the lab room for **4 points**. You will not be graded on how accurate or precise your data are, but rather that all the trials are complete and the appropriate number of figures are recorded for each measurement.

Step 6: With the collected data, you will now need to complete a worksheet with calculations and follow-up questions, and turn it in to CANVAS. Included in the calculation worksheet will be questions on the result's accuracy and precision, as well as any sources of error, so this will also effectively cover what would be in a typical conclusion/summary assignment. Generally, there will be part of a lab period, or even an entire lab period, dedicated to helping with the calculations. The required lab calculations and follow-up questions will be available as a pdf at the beginning of each experiment under the calculation assignment for that lab. Due dates are on the canvas assignments.

IMPORTANT NOTE: Some labs may have questions and calculations throughout or at the end of the lab manual. While these questions may be similar, the real calculations for each lab are instead given on the pdf attached to the worksheet assignment for that lab.

Green Crystal Revisit Worksheet. In CHEM 1B, we did an experiment called Green Crystals. While this is usually a popular lab with many fun techniques to determine the composition, we don't really go to deep in understanding what the green crystal really are, what elements are connected to each other, and why there are two different cations. After going

through the chapter 26 material on coordination compounds, we will have enough background to fully understand green crystals, so we will revisit that lab with a worksheet to take a closer look and even imagine other similar reactions we could perform.

Formal Laboratory Report. For the electrochemistry experiment, you will do a formal, typed report worth **30 points** that will contain all parts of the lab together in one document, rather than individual parts turned in separately, as in the other labs.

In scientific research, conveying what you have discovered in a clear, concise manner is essential to making your new ideas accessible to others and allowing your contributions to help the world.

It may feel like something completely new if you have not done a scientific report, and that is okay. We will not be doing everything that a manuscript would require but rather looking to gain familiarity with presenting an experimental study. I will talk about the specifics during the introduction for this lab, and I will provide an instruction sheet to help with the structure of this report.

Lab Final. The lab final will test your understanding of the theories utilized in lab this quarter as well as the calculations implemented to yield results from the raw data. This exam will be during your lab time during the last week of class and is worth **100 points**. You will be allowed to use any notes you have taken throughout the entire quarter during this test, so it is beneficial to organize your work and pay attention during the lab introductions. Computers or tablets aren't allowed during the lab final, so we will spend the lab period before the lab final printing out any notes so you won't have use your own paper or ink. No early or late exams will be allowed. No working with chemicals is required.

Grade Assignment. This rubric is subject to change throughout the quarter.

Grade	Percentage
A+	>97
A	97-93
A-	93-90
B+	90-87
B	87-83
B-	83-80
C+	80-76
C	76-70
D	70-60
F	<60

Lecture Schedule: Lecture topics are in black, quizzes are in orange, exams are in red, and holidays are in green. The dates for lecture topics may change but the exam dates will not.

Week #	Tuesday	Thursday
1	Chapter 18	Chapter 18
2	Chapter 18	Quiz 1 Chapter 18
3	Chapter 18	Chapter 14
4	Chapter 14	EXAM 1
5	Chapter 14	Chapter 14
6	Chapter 20	Quiz 2 Chapter 20
7	Chapter 20	Chapter 20
8	Chapter 20	EXAM 2
9	Chapter 26	Chapter 26
10	Chapter 26	Quiz 3 Chapter 21
11	Chapter 21	Juneteenth NO LECTURE

LECTURE FINAL EXAM: THURSDAY, June 26, 4:00 PM – 6:00 PM

Lab Schedule:

WEEK	MONDAY	TUESDAY	WEDNESDAY	THURSDAY
1	Check-In Syllabus Intro	Check-In Syllabus Intro	pKa of INDICATOR (1)	pKa of INDICATOR (1)
2	pKa of INDICATOR (2)	pKa of INDICATOR (2)	BUFFERS (1)	BUFFERS (1)
3	BUFFERS (2)	BUFFERS (2)	BUFFERS (3)	BUFFERS (3)
4	FREEZING POINT (1)	FREEZING POINT (1)	FREEZING POINT (2)	FREEZING POINT (2)
5	Ksp & COMMON ION EFFECT (1)	Ksp & COMMON ION EFFECT (1)	Ksp & COMMON ION EFFECT (2)	Ksp & COMMON ION EFFECT (2)
6	Ksp & COMMON ION EFFECT (3)	Ksp & COMMON ION EFFECT (3)	ANIONS (1)	ANIONS (1)
7	ANIONS (2)	ANIONS (2)	ELECTROCHEM (1)	ELECTROCHEM (1)
8	Memorial Day NO LAB	Study Day	ELECTROCHEM (2)	ELECTROCHEM (2)
9	CATIONS (1)	CATIONS (1)	CATIONS (2)	CATIONS (2)
10	CATIONS (3)	CATIONS (3)	CATIONS (4) Lab Final Prep Day Check Out	CATIONS (4) Lab Final Prep Day Check Out
11	Study Day	LAB FINAL	LAB FINAL	Juneteenth NO LAB

Lab Safety/Preparedness

Maintaining safety when performing experiments is a primary concern. There are many hazards associated with chemistry labs, so it is essential to recognize these hazards and understand that with proper techniques, the risk drops significantly. There are a few very simple steps students should take to execute safe lab techniques.

First, always wear personal protective equipment (PPE) when performing lab experiments. Such items include, but are not limited to, safety goggles, long pants, sleeved shirts, and closed-toe shoes. **All of this safety equipment must remain on until you complete the experiment, including cleanup.** A detailed list containing safe lab procedures and general practices is given on the next page and must be reviewed and signed before starting experiments.

Second, read the lab procedure BEFORE executing the lab procedure. Notes, facts, or some recognition of the hazards is required for the prelab to ensure the section on safety has been read. Reading the procedure ahead of time and knowing what tasks are at hand will also help the experiment go smoothly.

Finally, listen carefully to the directions provided by the instructor. Many techniques can be performed safely and easily with the proper technique but become a safety hazard when performed improperly

What follows is a list adapted from the American Chemical Society Safety In Academic Laboratories Guidelines, 7th Ed. The following mandatory minimum safety requirements must be followed by all students and be rigorously enforced by all Chemistry faculty:

Laboratory Safety Contract
Adapted from the American Chemical Society Safety In Academic Laboratories Guidelines, 7th edition. These minimum safety requirements must be followed by all students and rigorously enforced by all chemistry faculty.

Instructions: All students must read and sign this contract prior to commencing lab activities or checking in to a lab drawer.

Enrollment Limits: Due to safety concerns and space limitations, enrollment for Chem 1ABC, Chem 10, Chem 25, and Chem 30AB is limited to no more than 30 students. Organic Chemistry (12ABC) is limited to no more than 26 students.

In case of an emergency, dial 911 from a classroom phone. If you must use a cellphone, the FHDA police emergency number is 408-924-8000.

Please see https://www.deanza.edu/collegeops/emergencies/evacuation.html for evacuation procedures and other emergency preparedness information.

The following rules must be followed at all times in the lab rooms, regardless of the activity.
1. Shoes that completely enclose the foot are to be worn at all times; NO sandals, open-toed, or open- topped shoes, or slippers, even with socks on, are to be worn in the lab
2. Shorts, cut-offs, skirts or pants exposing skin above the ankle, and sleeveless tops or tops that expose the abdomen may not be worn in the lab: ankle-length clothing must be worn at all times.
3. Eating, drinking, or applying cosmetics in the laboratory is forbidden at ALL times, including during lab lecture. Food and drink containers must be stored outside the lab.
4. Use of electronic devices requiring headphones or earbuds in the laboratory is prohibited at ALL times, including during lab lecture.

The following rules must be followed anytime students have glassware or chemicals out and in use. Note that if some students finish their experiments, they must keep their PPE on while others have chemicals and glassware out.
5. Chemistry Department-approved safety goggles (NOT safety glasses) must be worn at all times once laboratory work begins. Safety goggles must include a flex seal and indirect venting, and carry ANSI Z87.1+ and CSA Z94.3 certifications. Appropriate goggles may be purchased from the De Anza College bookstore.
6. Goggles must be worn at all times after lab lecture, including when obtaining equipment from the stockroom or removing equipment from student drawers, and may not be removed until all laboratory work has ended and all glassware has been returned to all student drawers.
7. Nitrile gloves should be worn when handling chemicals and glassware and removed prior to handing any personal electronic devices.
8. Hair reaching the top of the shoulders must be tied back securely
9. Loose clothing must be constrained
10. Chemically-resistant and flame-retardant lab coats are strongly recommended.

11. Shoes made out of leather or polymeric leather substitute are strongly recommended.
12. Wearing "...jewelry such as rings, bracelets, and wristwatches in the laboratory..." is discouraged to prevent "...chemical seepage in between the jewelry and skin...".
13. Students with a medical condition or disability (e.g. learning, sensory, mental health, or physical condition) that may hinder their ability to participate or succeed in the class safety should contact DSPS to coordinate accommodations. You may also communicate necessary accommodations directly to your instructor, and you are under no obligation to reveal private details.
14. If you are pregnant or experiencing a related condition, you are advised to contact the campus Title IX coordinator (Laureen Balducci, balduccilaureen@fhda.edu) to arrange necessary accommodations.
15. Students are required to know the locations of the eyewash stations, emergency showers, and all exits.
16. Backpacks and other trip hazards must be stored under a desk and walkways must remain clear.
17. Students may not be in the lab without an instructor being present.
18. Students on the waitlist may not participate in lab activities until and unless enrolled in the course.
19. Except for soapy or clear rinse water from washing glassware, NO CHEMICALS MAY BE POURED INTO THE SINKS; all remaining chemicals from an experiment must be poured into the waste bottle provided by your instructor.
20. You may only perform experiments as instructed.
21. At the end of each experiment, all glassware should be cleaned with water and detergent prior to storage.
22. Any chemical spills or broken glassware must be cleaned up immediately. Broken glassware must go in the sharps waste and not in the regular trash.
23. Students are required to follow the De Anza College Code of Conduct at all times while in lab: “horseplay”, yelling, offensive language, or any behavior that could startle or frighten another student is not allowed during lab.
24. Reckless behavior will not be tolerated. If your actions endanger the health and safety of yourself or someone else you will be asked to leave and you will receive a zero for the day.

By signing below, I, _____ _____
(first name) (family/last name)

Acknowledge that I fully understand and agree to abide by the laboratory safety rules listed above. Further, I acknowledge that my failure to abide by these rules will result in my being dropped from this chemistry class immediately.

_____ _____
Signature Date

Student Learning Outcome(s):

• Apply the principles of equilibrium and thermodynamics to electrochemical systems.

• Apply the principles of transition metail chemistry to predict outcomes of chemical reactions and physical properties.

• Evaluate isotopic decay pathways.

• Demonstrate a knowledge of intermolecular forces.

Office Hours:

M	10:30 AM - 11:30 AM	SC1226
W	10:00 AM - 11:00 AM	Physical Science and Technology Village Center Room S55
TH	10:30 AM - 11:00 AM	Physical Science and Technology Village Center Room S55
TH	2:45 PM - 4:15 PM	SC1226