

# Chemistry 167L Course Syllabus

Spring 2024

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**Office Hours:** TBD; in person or virtual (for virtual, please email beforehand)

*CHEM 167 is a co-requisite for CHEM 167L, i.e., students in CHEM 167L must register for CHEM 167, but students in CHEM 167 are not required to take CHEM 167L. Students who drop or change to AUDIT classification in CHEM 167 must drop CHEM 167L. Students who drop CHEM 167 must drop CHEM 167L too. However, students are allowed to drop CHEM 167L without dropping CHEM 167. Students may not register to audit CHEM 167 after 5:00 PM on January 29th. The audit does not count towards full-time student status. **To add or drop lab sections during the first week of class, use AccessPlus. After the first week, please go to the Undergraduate Chemistry Office in 1608 Gilman (M-F 8 – 11:50 am and 1 – 5 pm). The last day to drop CHEM 167L is March 29th.***

**Learning Objectives:** (1) properly collect scientific data; (2) analyze and interpret a set of scientific data; (3) identify unknown substances with various techniques; (4) apply the law of conservation of mass to specific problems; (5) study the quantitative aspects of chemical reactions (empirical formula, stoichiometry, heat exchange, yield, etc.); (6) explore various chemical concepts (equilibrium, kinetics, atomic spectroscopy, diffraction, electrochemistry, etc.)

## **Required Items:**

**Laboratory Text:** Provided free of charge on the course Canvas site.

**Safety Eyewear:** UVEX — Model S040C Safety Glasses or Jones & Co. Visorgogs or Magid Glove and Safety Manufacturing “Sapphire” safety glasses. Available for purchase from the ISU Bookstore at the Memorial Union, ChemStores (Gilman 1400), or anywhere on the web. Safety eyewear may be purchased at the bookstore. If you already have goggles from other courses, you may use them as long as they are Z87 impact-rated. Other styles or types of protective eyewear will NOT be permitted.

**Lab Coat:** Available for purchase from the ISU Bookstore at the Memorial Union, ChemStores (Gilman 1400), or anywhere on the web. If you already have a lab coat from other courses, you may use it as long as the fabric contains more than 50% cotton to ensure it is flame resistant.

### Important Course Policies:

1. It is the student's responsibility to make sure that homework is properly uploaded/submitted by the deadline. In case of technical problems, please email IMMEDIATELY your TA. Do not wait until the deadline has passed otherwise your work will not be graded.
2. It is the student's responsibility to check grades on Canvas on a weekly basis.
3. Any complaint on a grade **MUST** be brought up within 1 week of receiving the returned graded work to have the grade corrected. No exceptions.
4. Electronic devices of any type (e.g., laptops and cell phones) cannot be used in the lab. Students will be asked to leave their devices in their backpack. Students may be asked to take pictures with their cell phones of experiments set-ups or reaction products by their TA.
5. Each week, students will work with different lab partners. Lab partners will rotate on a weekly basis. The TA will assign partners at each lab period.
6. Presence at Lab Check-out is mandatory. Absence will result in 5 points being deducted from the last graded item.
7. If no teaching assistant shows up for your recitation/laboratory section, send one student to 1608 Gilman to find a substitute teaching assistant. The department will find a substitute as soon as possible.

**Personal Protective Equipment (PPE):** Safety eyewear, gloves (provided in lab), lab coat, face covering, and fully covered shoes are important components for lab safety. **Sandals are not allowed.** You will not be allowed to do the experiment if you are not in proper attire. **Goggles/lab coat/gloves/are to be worn at all times in the lab until all the chemicals have been put away. Please wear gloves when typing at the computer provided in lab.** Repeated offenses can result in dismissal from the course. In addition, *you are NOT allowed to wear PPE out in the hallway* so as to avoid contamination. **Failing to follow these safety rules will result in the loss of 5 points for each offense starting from the second warning.**

**Pre-lab quizzes:** You are expected to come to the laboratory prepared to do the work. **Prior** to each class you must have read the appropriate chapter in the electronic lab manual (found on Canvas). You are expected to complete the **pre-lab** quiz for the experiment before your class starts. Pre-lab quizzes may include questions about safety readings (the reading material is found on Canvas). **Late pre-lab quizzes will have 0 points and may not be completed after the due date.** Pre-labs are timed quizzes: once started you will have 30 minutes to complete the quiz in one session. You will be given up to three attempts (each 30 minutes) and the average of the scores will be taken.

**Laboratory Notebook:** Your laboratory teaching assistant (TA) will discuss the laboratory notebook at the check-in session during the first week of class. Laboratory experiments will be recorded using an electronic lab notebook (ELN) by LabArchives. In the laboratory, each student will have access to a computer. Your lab report will consist of four main parts: pre-lab writing (do not confuse this with the pre-lab quiz), in-lab notes, analysis, and reflective writing. **NOTE:** *for proper submission, you must click the "SUBMIT" button. If you don't, your work will appear as missing.*

Pre-lab writing: You are expected to write the "pre-lab" part of the experiment prior to arriving in class (as evidenced by the timestamp). **Failure to have the pre-lab part completed before class will result in 0 points for that part of the lab report.**

In-lab notes: Methods and observation must be recorded on your ELN during your lab period (as evidenced by the timestamp). **Failure to have the notes completed DURING class will result in 0 points for that part of the lab report.**

Analysis and Reflective writing: Graphs, final data analysis, and calculations as well as reflective writing may be added after your lab period.

Finally, you must submit your ELN **by 11:59 p.m. of three days after the experiment** (e.g., for Monday labs, submit by 11:59 p.m. of Thursday). **Late lab reports will have 0 points (no partial credit).**

**Post-lab quizzes** must be completed before the next experiment. You will be given three attempts and 1 hour (for each attempt) to complete the quiz in one session and the average of the scores will be taken. **Late post-lab quizzes will have 0 points and may not be completed after the due date.**

**Safety assignments:** You have four Safety readings for the first four labs. Each has a corresponding quiz. Safety assignments must be completed on-line on Canvas. You will be given up to three attempts (each 30 minutes) and the average of the scores will be taken. They must be completed before going to the laboratory by the deadline (see schedule). No excuses are accepted for missing a due date.

**Missed Experiments and Practical Exams:** In general, **there are NO MAKE-UP laboratories.** The top 11 experiment scores for each category of pre-lab quizzes, ELNs, and post-lab quizzes (irrespective of the experiment they belong) will be used to calculate the final grade. Missed experiments will have a score of zero, regardless of the circumstances. **Missed Practical Exams will be counted as zero.** All four safety quizzes will be counted for final grade.

**DROPS:** Please note that drops do not occur at the end of the semester. Starting on week 3, Canvas will drop your lowest scores on a daily basis every time you receive a grade, and the grade will be updated based on your new drops, which might differ from week to week depending on your performance. Therefore, the grade you see on Canvas is the grade with drops already included.

**Grading:** The score for each experiment is made up of three parts, each with a different weight: pre-lab quiz ( $10 \times 20$  pts = 200 pts), ELN report ( $11 \times 40$  pts = 440 pts), post-lab quiz ( $11 \times 40$  pts = 440 pts). In addition, the final grade will depend on four safety quizzes ( $4 \times 4$  pts = 16 pts), and three practical exams (3 exams = 63 pts). **Total pts = 1159 pts.**

Grading scale for final grades: A > 93.00%, A- > 90.00%, B+ > 87.00%, B > 83.00%, B- > 80.00%, C+ > 77.00%, C > 73.00%, C- > 70.00%, D+ > 67.00%, D > 63.00%, and D- > 60.00%, and F < 60.00%.

**Please note that, with the 6 drops granted (2 for pre-lab quizzes, 2 for ELNs, and 2 for post-lab quizzes), your grade is already higher than it was before the assignment drops. Therefore, NO GRADE ROUNDING OR CURVE WILL BE APPLIED. NO EXCEPTIONS.**

## Statements

**Academic misconduct:** Academic Misconduct in any form is in violation of ISU *Student Disciplinary Regulations* and will not be tolerated. This includes, but is not limited to: copying or sharing answers on tests or assignments, plagiarism (including from lab manual), submitting a lab report for an experiment not performed, and having someone else do your academic work. Anyone suspected of academic dishonesty will be reported to the Dean of Students Office.

(<https://www.studentconduct.dso.iastate.edu/academic-misconduct>).

**Public Health:** If you are not feeling well, you should stay home and focus on your health. Should you miss class due to illness, it is your responsibility to work with your instructor to arrange for accommodations and to make up coursework, as consistent with the instructor's attendance policy. You may choose to wear a face mask and/or receive the COVID-19 vaccine and boosters, as well as other vaccines such as influenza, but those options are not required. Thielen Student Health Center will continue to provide COVID-19 vaccinations free-of-charge to students. The university will continue to offer free masks and COVID-19 test kits during the fall 2022 semester. Other wellbeing resources for students are available at: <https://www.cyclonehealth.iastate.edu/wellbeing-resources/>

Public health information for the campus community continues to be available on Iowa State's public health website. All public health questions should be directed to [publichealthteam@iastate.edu](mailto:publichealthteam@iastate.edu).

**Accessibility Statement:** Iowa State University is committed to assuring that all educational activities are free from discrimination and harassment based on disability status. Students requesting accommodations for a documented disability are required to work directly with staff in Student Accessibility Services (SAS) to establish eligibility and learn about related processes before accommodations will be identified. After eligibility is established, SAS staff will create and issue a Notification Letter for each course listing approved reasonable accommodations. This document will be made available to the student and instructor either electronically or in hard-copy every semester. Students and instructors are encouraged to review contents of the Notification Letters as early in the semester as possible to identify a specific, timely plan to deliver/receive the indicated accommodations. Reasonable accommodations are not retroactive in nature and are not intended to be an unfair advantage. Additional information or assistance is available online at [www.sas.dso.iastate.edu](http://www.sas.dso.iastate.edu), by contacting SAS staff by email at [accessibility@iastate.edu](mailto:accessibility@iastate.edu), or by calling 515-294-7220. Student Accessibility Services is a unit in the Dean of Students Office located at 1076 Student Services Building.

**First amendment Statement:** Iowa State University supports and upholds the First Amendment protection of freedom of speech and the principle of academic freedom in order to foster a learning environment where open inquiry and the vigorous debate of a diversity of ideas are encouraged. Students will not be penalized for the content or viewpoints of their speech as long as student expression in a class context is germane to the subject matter of the class and conveyed in an appropriate manner.

## Laboratory Experiment Schedule

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Week #	Week of	Experiment
1	Jan 15	Lab Check-In, Safety Orientation, Introduction to ELN, <i>Safety Assignment 1</i> *Monday lab sections will not meet due to University Holiday: week 1 material will be covered during week 2.
2	Jan 22	Chemical and Physical Properties, <i>Safety Assignment 2</i>
3	Jan 29	Chemical and Physical Properties (continued), <i>Safety Assignment 3</i>
4	Feb 5	Measurements, <i>Safety Assignment 4</i>
5	Feb 12	Polymers
6	Feb 19	Identifying a Chemical Reactant + <b>Practical Exam 1</b>
7	Feb 26	Chemical Reactions in the Atmosphere
8	Mar 4	Atomic Spectroscopy
9	Mar 11	<i>Spring Break</i>
10	Mar 18	The Phase Diagram for the Bismuth-Tin System + <b>Practical Exam 2</b>
11	Mar 25	Heat Exchange in Chemical Processes
12	Apr 1	Optical Diffraction
13	Apr 8	Kinetics
14	Apr 15	Oxidation-Reduction Reactions + <b>Practical Exam 3</b>
15	Apr 22	Galvanic Cells
16	Apr 29	<b>Lab check-out - Attendance is mandatory (5-point penalty on last graded item)</b>