

Chemistry 178L Course Syllabus

Summer 2023

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*CHEM 178 is a co-requisite for CHEM 178L, i.e., students in CHEM 178L must register for CHEM 178 or to have already received credit in 178. However, students in CHEM 178 are not required to take CHEM 178L. Co-requisite course requirements are strictly enforced: Students who do not meet the co-requisite should drop the course or they will receive an F in the course. **Students who drop Chem 178 will be required to drop 178L. To add or drop recitation or lab sections during the first week of class, use AccessPlus. After the first week, please email amwade@iastate.edu or call 515-294-6361. The last day to drop CHEM 178 is May 19th.***

Learning Objectives: (1) understand the importance of instrument calibration; (2) explore various chemical concepts (equilibrium, kinetics, electrochemistry, etc.); (3) study the quantitative aspects of chemical reactions (galvanic cells, electrochemistry, etc.); (4) read and analyze a published research procedure so as to interpret, repeat, modify, and extend the procedure.

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. 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 without approval from the department safety officer or lab instructor (Dr. Pistolesi).

Lab Coat: Available for purchase from the bookstore. 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 ELN.
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, 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.** A student caught without PPE in the lab will receive a 5-point penalty per instance on the final lab grade. Repeated offenses can result in dismissal from the course. All instructors and laboratory personnel are entitled to take points off. 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.

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.** The only exception to this requirement will be the first two weeks of classes. This requirement will take place on week 3.

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. **Late post-lab quizzes will have 0 points and may not be completed after the due date.**

Exam: Project - Photoreduction of Iron(III) in Marine Ecosystems, which involves writing a short proposal and writing a related research report. Students will work in teams of 2–3; the laboratory activities occur over a two-week period (see “Course Schedule”), and there is no Pre-lab or Post-lab quiz for this activity. Evaluation of this project will be scored as follows:

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| (i) | Written Proposal (one per student); | (average of 2 submissions) 100 pts max |
| (ii) | Beer-Lambert determination of iron (II); | 100 pts max |
| (iii) | Project Notes and Documentation in ELN; | 100 pts max |

IMPORTANT: All the students are responsible for submitting their own copy of the proposal drafts, ELNs, and research report for credit. In detail, proposal drafts and research report are written as a group but each member of the group is required to submit their own copy. ELNs for the project are written and submitted individually as any other ELN.

Missed Experiments: In general, **there are NO MAKE-UP laboratories.** At the end of the semester, the top 8 experiment scores for each category of pre-lab quizzes, ELNs, and (top 9 for) 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.

DROPS: Please note that drops do not occur at the end of the semester. 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.

Reschedules: Students are NOT allowed to reschedule **any** laboratory.

Grading: The score for each experiment is made up of three parts, each with a different weight: pre-lab quiz (8×20 pts = 160 pts), ELN report (8×40 pts = 320 pts), post-lab quiz (9×40 pts = 360 pts). In addition, the final grade will depend on the final exam (project, 300 pts). **Total pts = 1140 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>).

Face masks encouraged: Because of the continuing COVID-19 pandemic, all students are encouraged—but not required—to wear face masks, consistent with current recommendations from the Centers for Disease Control and Prevention. Further information on the proper use of face masks is available at: <https://www.cdc.gov/coronavirus/2019-ncov/your-health/effective-masks.html>.

Vaccinations encouraged: All students are encouraged to receive a vaccination against COVID-19. Multiple locations are available on campus for free, convenient vaccination. Further information is available at: <https://web.iastate.edu/safety/updates/covid19/vaccinations>.

Vaccinations may also be obtained from health care providers and pharmacies.

Physical distancing encouraged for unvaccinated individuals: Classrooms and other campus spaces are operating at normal capacities, and physical distancing by faculty, staff, students, and visitors to campus is not required. However, unvaccinated individuals are encouraged to continue to physically distance themselves from others when possible.

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, by contacting SAS staff by email at 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

178L

Summer 2023

Day	Date	Experiment
1	May 15–16	Lab Check-In, Safety Orientation, and Introduction to ELN
2	May 17–18	Kinetics of the Decomposition of Hydrogen Peroxide
3	May 22–23	Reversible and Irreversible Processes
4	May 24–25	Partition Coefficients
5	May 29–30	No Labs due to Memorial Day
6	May 31– Jun 1	Acids, bases, and Salts
7	Jun 5–6	Buffers <i>Prepare Iron(II) Oxalate for “Solubility Product Constant” exp.</i>
8	Jun 7–8	Titration Curves
9	Jun 12–13	Determining a Solubility Product Constant
10	Jun 14–15	Oxidation Reduction Reactions
	Jun 15	Deadline for First Proposal submission
	Jun 18	Deadline for Proposal Draft Feedback from TA
11	Jun 19–20	Electrochemistry: Galvanic Cells
12	Jun 21–22	Electrochemistry: Electrolytic Cells
	Jun 21	Deadline for Final Proposal Submission
	June 24	Deadline for Final Proposal Feedback from TA
13	Jun 26–27	Project (Beer Lambert + Replication)
14	Jun 28–29	Project (Modification) + Lab check-out - Attendance is mandatory (5-point penalty on last graded item)
15	Jul 3–4	No Labs due to July 4th