CHEMISTRY 254 General Chemistry II Laboratory Spring 2022

J. C. Molloy **Course Instructor** (ISC 2031, ext. 12546, jcmolloy@wm.edu)

R.E. O'Brien Monday 3-6 (ISC 1058, ext. 11858, reobrien@wm.edu)

W. R. McNamara Tuesday 11-2 (ISC 2035, ext. 14868, wrmcnamara@wm.edu)

C. Kumas Tuesday 2-5 (ISC 1285, ext. 11500, ckumas@wm.edu)

1. Lab discussion is online through Blackboard. A Prelab Quiz must be completed with a 100% grade before attending lab. **Failure to achieve a 100% one hour before lab time** will result in a **25-point reduction** in your **lab report grade** for that experiment.
2. You **must** bring a printed copy of the lab procedure for each experiment to the lab. There is a ten point penalty for failure to do so.
3. Calculators are necessary for calculations in every lab exercise.
4. Each student must provide personal eye protection. **Splash goggles are required to perform the lab** and may be purchased at the College Bookstore or elsewhere.
5. Reports must be written in ink on the report sheets. **Do not erase or white-out data**. If a digit is to be changed, draw a single line through the incorrect digit and write the correct digit **above**, not over, the crossed-out digit. "Erasable ink" is graded as **pencil with a 10 point penalty**.
6. Reports must be completed in the laboratory and handed in prior to leaving the laboratory unless otherwise indicated.

Laboratory Schedule for Spring 2022

Dates	Expt. #	Experiment
Jan 31, Feb 1	**1**	Determination of Chloride and Vitamin C
Feb 7, 8	**2**	Some Analyses of Water
Feb 14, 15	**3**	pH and Potentiometric Titrations
Feb 21, 22	**4**	Photometric Determination of an Equilibrium Constant
Feb 28, Mar 1	**5**	Inorganic Synthesis of Alum and CuCl
Mar 7, 8	**6**	Determination of a Cation Mixture using Cation Exchange
Mar 14, 15		**Spring Break!**
Mar 21, 22	**7**	Synthesis of a Coordination Compound (Week 1) **Midterm Exam**
Mar 28, 29	**8**	Electrochemistry
Apr 4, 5	**7** **9**	Synthesis of a Coordination Compound (Week 2) Complexes of Copper
Apr 11, 12	**10**	Identification of an Unknown Salt
Apr 18, 19	**11**	Determination of the Mole Ratio in a Complex
Apr 25, 26	**12**	Analysis of a Coordination Compound
May 2, 3	**Final Exam,** taken in the **lab section** in which you are registered	

Sections	1-3 5-8 9-12	Monday 3–6 pm Tuesday 11–2 am Tuesday 2– 5 pm	Students are expected to attend all labs in the section for which they are registered—**no section hopping**. If it is necessary to switch sections for an experiment, you must obtain permission **in advance**.

Grading: Experiments: 60% Midterm Exam: 20% Final Exam: 20%

A: 100-95, **A-**: 94-90, **B+**: 89-87, **B**: 86-83, **B-**: 82-80, **C+**: 79-77,
C: 76-73, **C-**: 72-70, **D+**: 69-67, **D**: 66-63, **D-**: 62-60, **F** < 60

No goggles will be available for lending. Students not prepared for lab with goggles will be unable to complete the lab.

Enrollment Deadlines

Add/Drop Deadline: Friday, February 4, 11:59 pm.

Withdraw Deadline: Monday, March 28, 11:59 pm.

Notice on absences and attendance policy

This semester, the world will enter its third year with COVID. As we experience a fifth surge of pandemic with the highly transmissible omicron variant, it is reasonable to expect significant levels of infection at W&M. As an academic community based on faculty and students convening, spring 2022 courses will largely consist of in-person instruction. All of us will follow W&M requirements - vaccinations and boosters, indoor masking, as well as quarantine and isolation when ill. That last is really important: for those who have tested positive, W&M's requirements must be fulfilled before class can be attended in person, and, out of an abundance of caution, anyone with symptoms consistent with COVID- even if they don't have a positive test- should not come to class.

Please note that testing positive for COVID or any other temporary illness is not considered a disability as defined by ADA guidelines and is not under the purview of W&M's Student Accessibility Services (SAS). Thus, any questions should be addressed via email to Prof. Molloy.

In the Chemistry 254 lab, **you are expected to have completed the required prelab material and to arrive on time for your lab each week.** If you are not present when the roll is called, you will be considered tardy and receive a 10 point penalty. Anyone more than 10 minutes late to lab will not be permitted to conduct the experiment and will be marked absent.

In general, **you must attend the laboratory section for which you are registered.** In some cases, legitimate medical or personal reasons may prevent you from attending the assigned lab time. In this case, contact Professor Molloy, preferably in advance of the absence. If you can attend a different lab section and space is available, Professor Molloy or Mrs. Shieh can make arrangements.

If circumstances prevent you from notifying Professor Molloy prior to the absence or you will not be able to come to lab at all that week, please **notify Professor Molloy within one week of the missed lab** and provide a reason for the absence. Understanding your situation may help us provide the support you need to successfully complete this course. If you do not contact Professor Molloy within a week of the missed lab, you will receive a grade of 0% on the relevant experiment.

Please note that you still will be responsible for understanding the material covered in any missed labs

and will be tested on them.

Because of the practical, hands-on nature of a laboratory course, no student can acceptably complete Chem 254 after having missed more than four labs. If you must be absent more than four times, the options of a medical withdrawal or an incomplete may be possible and will be discussed with you.

Faculty and teaching assistants may become ill during the course of the semester. If this occurs, the department already has procedures to find substitute teaching assistants. Multiple faculty teach the course, so they work together to cover any absences.

Laboratory Dress

- Shoes must cover the entire foot. Sandals (with or without socks), flip flops, open-backed clogs and bare feet are not allowed.
- Upper body clothing must cover the torso and the upper arm area. Muscle shirts and tops with spaghetti straps, crop-tops, bare midriffs, or exposed shoulders are not appropriate. T-shirts are a good choice for minimal exposure.
- Lower body clothing must cover the entire leg. Jeans are a good choice and full-length skirts are allowed.
- Goggles are required for eye protection.

Failure to comply with the lab clothing policy will result in exclusion from that week's lab.

Course Materials

Multiple materials will be used in the laboratory.

Equipment:

- Chemical splash goggles are required during lab work. The book store sells chemical splash goggles, but that model of goggle is not required. Other vendors, both local and online, have suitable replacements. Please contact J. Molloy if you have questions on appropriate goggles.

Written Materials:

- The Chem 208 lecture text -- E. J. Neth, P. Flowers, K. Theopold, R. Langley, W. R. Robinson, *Chemistry: Atoms First*, 2nd ed., OpenStax: Houston, TX, ISBN: 9781947172630 (2019). https://openstax.org/details/books/chemistry-atoms-first.
- Lab procedures are available on Blackboard.
    * **Students are required to print out materials and bring them to lab**. A ten point penalty will be assessed if the student is not prepared.

Video Materials:

- Pre-lab lecture materials are available on Blackboard.
- Additional video material may be available from library resources or the internet.

Software:

- Spreadsheet programs will be used for calculation and visual display of results. **Microsoft Excel**, which is available for all students, and **Google Sheets**, available on the internet, will be used.
- **Zoom** will be used as needed for meeting with students. It is free to the student.
- **Blackboard** will be used to post all experimental procedures, pre-lab recordings and any supplemental materials. Pre-lab assignments will be completed on Blackboard.
- **Gradescope** will be used for grading laboratory assignments. Gradescope is free to the student.
- **Piazza** might be used for discussions and announcements. It is free to the student. Please sign up at www.piazza.com. By asking questions on Piazza, you can receive assistance from classmates, TAs, and instructors. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza.

Office Hours

J. Molloy **Info:** ISC Rm 2031, ext. 12546; jcmolloy@wm.edu;

Office Hours: Monday 12-1; Tuesday 9:30-10:30; by appt.

Student Accessibility Services

William & Mary accommodates students with disabilities in accordance with federal laws and university policy. Any student who feels they may need an accommodation based on the impact of a learning, psychiatric, physical, or chronic health diagnosis should contact Student Accessibility Services staff at 757-221-2512 or at sas@wm.edu to determine if accommodations are warranted and to obtain an official letter of accommodation. For more information, please see www.wm.edu/sas. Specific discussion may be needed on how qualifying needs impact laboratory activities.

Diversity & Inclusion Vision Statement

The College of William & Mary values and actively nurtures an environment of diversity and inclusiveness where every individual, regardless of how we may differ – for example, but not limited to, with regard to race, religion, gender, ethnic origin, age, socioeconomic status, political preferences, physical abilities, or sexual orientation – is embraced, respected, and afforded the same opportunity to grow, to succeed, and to contribute to the William & Mary's success.

Honor Code

All students are expected to follow the W&M Honor Code. For more information, please see:

https://www.wm.edu/offices/deanofstudents/services/communityvalues/honorcodeandcouncils/honor-code/index.php

Update Policy

Changes may be required to this syllabus during the course of the semester. If changes are made, an updated version will be made available and placed on Blackboard as Syllabus -- Current. Previous versions will remain.

Lab Submissions

- Safety training and a completed safety agreement is required before starting work in the laboratory. Information on safety training will be communicated by the first day of class. The safety agreement is available on Blackboard.
- Pre-lab assignments will be conducted and graded on Blackboard. Assignments for all sections are due one hour before the start time of the lab section. **Students that do not complete the pre-lab on time will receive a 25 point penalty on the lab report**. **A score of 100% is needed before you are able to attend the lab.**
- Students have four opportunities to achieve a 100% grade on the prelab assignment. If you do not get a 100%, you will need to speak with Prof. Molloy in order to request more attempts.
- Laboratory assignments & exams will be graded on Gradescope.
- Lab assignments will be submitted on the lab manual report sheets at the end of the laboratory period unless otherwise indicated.
- The faculty member may, if circumstances dictate and a sincere effort has been made to complete the lab on time, decide to allow student(s) to complete an assignment after the end of the laboratory period. The report will be due as directed by the faculty member. Teaching assistants may not allow late submissions.

Version 1.0

Date January 25, 2022

This version of the syllabus supersedes all previous versions of the syllabus.