

Syllabus

Site: **Rose-Hulman Institute of Technology**
Course: CHEM115L-53, General Chemistry III Lab
(Weatherman, Spring 2024)
Book: Syllabus

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1. Course Information

Course Title and Number: General Chemistry III Lab (CHEM115L-53)

Credit Hours: 1

Course Quarter: Spring 2023-24

Course Format:

8 Face-to-Face lab sessions (3 hours each)

Course Location:

Lab sessions: J308

Pre-lab meeting: J300A

Course Time:

Friday, 8:00-10:50 AM

2. Instructor Information and Biography

Ross V. Weatherman, Ph.D.

Professor and Department Head of Chemistry and Biochemistry

Department and Office Location: CHEM/BC, Moench C206 (inside of C205)

E-mail: weatherm@rose-hulman.edu

Website: [click here](#)

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Office Hours: TBA

Short Bio:

Ross Weatherman has been working and teaching as a professional chemist for over 25 years. After getting his doctorate in organic chemistry as an NIH Biotechnology Fellow at University of Wisconsin-Madison, he then taught and did pharmaceutical research as an American Cancer Society Research Fellow at University of California, San Francisco and as an assistant professor in the Department of Medicinal Chemistry and Molecular Pharmacology at Purdue University. One of his main reasons for moving to Rose-Hulman in 2009 was to expose great students to the world of chemistry and to the interface between chemistry and biochemistry as it applies to how drugs are discovered and developed.

3. Course Details

Course Description

This course will build upon the chemistry foundation set in General Chemistry I and II labs and introduce more concepts and technical skills associated with the practice of chemistry. This course focuses on concepts and technical skills associated with chemical equilibria, pH, electrochemistry, and qualitative analysis.

Course Objectives: This course has been designed to give you the tools you need to accomplish the following:

- **Laboratory Skills and Communication:** Translate a procedure described elsewhere into a working protocol, execute that protocol, process qualitative and quantitative data from the experiment, and then organize and report the experimental narrative, results, data evaluation and interpretation in an effective manner.
- **pH:** Measure the pH of a solution using both a pH meter and a colorimetric pH indicator. Prepare and test the efficacy of a buffer using a pH meter.
- **Titrations:** Execute a titration and use titration methods to quantitatively determine the concentration of an unknown acid or base solution.
- **Electrochemistry:** Prepare voltaic cells and use a voltmeter to determine their chemical potential. Determine equilibrium constant K data by measuring the potentials of specifically chosen electrochemical cells.
- **Qualitative Analysis:** Perform chemical reactions for transition metal ions noting specific reactivities and shifts in relevant equilibria. Develop and test a separation scheme for up to three metal cations in order to separate and identify the individual components.

3.1. Course Schedule

Week	Experiment(s)	Pre-Lab	Report
< 1	Safety Module	Safety Quiz (10) Statement of Student Safety (5)	
1	<i>Determining the pH of Salt and Buffer Solutions</i> Lab Drawer Check-In (5 points)	Moodle Quiz (5)	Individual (25)
2	<i>Monitoring Acid-Base Titrations with a pH Meter and a Conductivity Meter</i>	Moodle Quiz (5)	-
3	<i>Monitoring Acid-Base Titrations with a pH Meter and a Conductivity Meter</i>	Bring pH and conductometric graphs to lab (5)	Pair (50) Workload Analysis (5)
4	<i>Le Chatelier's Principle and Lewis Acid-Base Chemistry</i>	Moodle Quiz (5)	Individual (25)
5	<i>Qualitative Analysis of Cations: The Copper(II) Ion</i>	Moodle Quiz (10)	Lab Notebook Check (5)
6	<i>Qualitative Analysis of Cations</i>	-	-
7	<i>Qualitative Analysis of Cations</i>	-	-
8	<i>Qualitative Analysis of Cations</i>	-	-
9	<i>Voltaic Cells Measurements</i>	Moodle Quiz (5)	Individual or Pairs (25)
10	<i>Qualitative Analysis of Cations: Unknowns Analysis</i> Safe practices throughout term (5 points) Lab Drawer Check-Out (5 points)		Individual (75 total)

4. Lab Policies

Required Material

- **Personal Protective Equipment:** Goggles are required personal protective equipment for this lab. Disposable masks will be provided at the beginning of the lab, but you must provide your own goggles. Safety glasses may be used if the goggles are not compatible with the safety goggles.
- **Laboratory Notebook:** Chemistry Laboratory Composition Notebook, 8x10. This notebook must be bound. Previous lab notebooks from other courses are OK to use provided that there is sufficient space.

Attendance

The face-to-face laboratory sessions are important to attend, but can be made up in some sort of fashion if the student is feeling ill. For the sake of the class and community, do not come to lab if you are feeling unwell.

Pre-lab preparation

Face-to-face labs will require pre-lab preparation. This will include online videos for you to watch and online quizzes that must be passed before the lab can be started. These short videos will introduce you to various aspects of the week's lab and should be watched before taking the online quiz.

Laboratory Reports

Laboratory reports/assignments/write-ups will be discussed on the day of lab and a due date will follow the assignment. The information regarding lab reports, grading rubrics, and additional assignments will be posted on the lab section Moodle page. Students must have been the lab and worked on the experiment to be included on the lab report. Misrepresentation of the people present for the lab is academic misconduct.

Participation/Attitude in Laboratory

Cleanliness and safe practices are required in the lab. Ask the instructor if you are unsure about how to do something or if you do not understand the reason for a procedure. Think about the chemistry that is happening in each step of an experiment. Anticipate outcomes with special attention to safety issues. Thorough and efficient operation in the lab is expected.

Safety

All safety rules must be followed at all times. Failure to comply will result in immediate expulsion from the lab. In some cases, a grade penalty will be accrued for failure to follow safety rules. Specific safety issues will be addressed in detail the day of lab. All accidents and injuries, no matter how minor, must be immediately reported to the instructor.

5. Grading Policy

Grading Policy

Grading Scale:

minimum course percentage to achieve each grade

A	90.0%
B+	87.5%
B	80.0%
C+	77.5%
C	70.0%
D	67.5%
F	60.0%

Access to Grades:

Students may access grades in the User Report in the Moodle Gradebook.

Late Assignment Policy:

Extensions may be granted. It is highly preferred that requests are made in advance of the due date.

6. Institutional Policies

Students with Accessibility Needs

Rose-Hulman is committed to working with students who have special needs or disabilities. Visit [the Accessibility Services website](#) for more information. Requests for academic accommodations must be documented with and approved by the Accessibility Services office before they can be implemented in this course.

Academic Integrity:

The [Student Handbook](#) and Rose-Hulman's [Academic Rules and Procedures](#) describe penalties and processes invoked as a consequence if academic misconduct (such as cheating, plagiarizing, or interfering with the academic progress of other students) takes place. It is the responsibility of each student to know and follow Rose-Hulman's rules about academic integrity.

Diversity Statement:

Rose-Hulman Institute of Technology is [committed to being an inclusive community](#) in which the multiplicity of values, beliefs, intellectual viewpoints, and cultural perspectives enrich learning and inform scholarship.

Online Access Requirements:

Rose-Hulman welcomes students from around the world, and encourages faculty, staff and students to travel around the world. However, geopolitical conditions and compliance with export law and regulations prevent us from delivering certain kinds of educational experiences and/or using certain kinds of Institute technologies in some locations. For example, students in locations with limited access to the internet in general, or with restricted access to portions of the internet, or which are embargoed by the U.S. Directorate of Defense Trade, may not be able to successfully complete Rose-Hulman courses.

Emergency Information:

To receive email or text messages regarding emergency situations that may impact campus and, possibly, the delivery of classes, [register for RAVE alerts](#) and/or follow [@Rose-HulmanAlert on Twitter](#). Any announcements about the Institute's ability to offer classes will be shared on [Rose-Hulman's website](#).