

Syllabus

Site: [Rose-Hulman Institute of Technology](#) Printed
Course: CHEM112 (General Chemistry Honors, by:
Weatherman, Fall 2024)
Book: Syllabus

Ross Weatherman

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1. Course Information

Course Information

Course Title and Number: General Chemistry Honors (CHEM112-02)

Credit Hours: 5

Course Quarter: Fall 2024-2025

Course Format:

Lecture

4 Face-to-Face sessions per week (50 minutes each)

Lab

1 Face-to-Face lab session every week (3 hours each)

Course Location:

Face-to-Face sessions: O103

Lab sessions; J308

2. Instructor Information and Biography

Ross V. Weatherman, Ph.D.

Professor of Chemistry and Biochemistry

Department and Office Location: CHEM/BC,C206

E-mail: weatherm@rose-hulman.edu

Website: [click here](#)

Office Telephone: 812-877-8718

Best Method of Contact: E-mail or chat through Microsoft Teams

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

See the [Course Introduction Video](#) for more details

Course Description

This course will establish the foundational concepts of chemistry as well as introduce technical skills associated with the practice of chemistry. Honors general chemistry combines the material from both General Chemistry I/General Chemistry I Lab (CHEM111/111L) and General Chemistry II/General Chemistry II Lab (CHEM113/113L) in one quarter. Successful completion of the course and lab will result in the student earning credit for all 4 courses.

Course Objectives:

CHEM112, Chemistry Honors, is an accelerated course covering topics in CHEM111 and CHEM113. You will learn fundamentals of general chemistry surrounding the topics of matter and energy that is important for all scientists and engineers. Specifically, this course has been designed to give you the tools you need in order to accomplish the following:

1. **Chemical Communication:** Apply knowledge of the [periodic table](#) of the elements to solve qualitative and quantitative problems using a standard calculator.
2. **Gas Laws:** Apply the concepts of ideal gas behavior to explain relationships among variables in the ideal gas law equation using only a standard calculator and a [periodic table](#) of the elements.
3. **Solutions:** Apply knowledge of wet gases and solutions to explain various phenomena and solve problems involving solution concentrations and multiple component gaseous systems.
4. **Chemical Bonding:** Explain the nature of ionic and covalent bonding using multiple theories including Lewis Dot Structures, VSEPR, Hybridization, and Molecular Orbital Theory.
5. **Chemical Thermodynamics:** Solve problems involving heat and energy transfer using appropriate methods.
6. **Chemical Equilibrium:** Solve quantitative problems of chemical equilibrium using the appropriate methods and describe equilibrium processes using accurate language and graphical representations.
7. **Chemical Kinetics:** Describe the rates and mechanisms of chemical reactions using the appropriate kinetic methods.
8. **Solid State:** Describe the [Pythagorean relationships](#) in single crystal metals and salts using a standard calculator.
9. **Laboratory Skills:** Collect simple and accurate scientific measurements of matter including density, mass, and volume. Interpret data accurately and precisely. Demonstrate understanding of your collected data by communicating it directly and effectively in written laboratory reports.

Course Text:

Tro, *Chemistry, A Molecular Approach*, 6th edition, Pearson Publishers

Course Requirements:

- Access to a computer or tablet with access to the internet
- Subscription to Mastering Chemistry Homework Website. A subscription to Mastering Chemistry is provided through an Inclusive Access arrangement. For more information see the Inclusive Access FAQ

Recommended/Other Resources:

Calculator: A basic scientific calculator will be needed to solve many of the problems. You will need to use the calculator on in-class exams and quizzes. Use of Maple is allowed, but open laptops will be subject to inspection anytime during a quiz or exam.

Personal Protective Equipment: While under the Rose Ready policies, facemasks must be worn during lab. Disposable masks will be provided at the beginning of the lab. A pair of chemistry splash goggles is recommended for any activities but some accommodations for safety glasses if the mask/goggle combination is not working.

Course Prerequisites:

This course has no prerequisites but students can only enroll with permission from the Department Head of Chemistry and Biochemistry

Course Duration:

This course will have 4 50 minute face-to-face sessions per week per student for the 10 weeks of the quarter. There will also be one lab session scheduled for 3 hours each week for 8 weeks. Exams and quizzes will be in-person.

Attendance

- There will be no attendance taken during class. While attendance to lecture has benefits, for the good of the class and the community, students must not come to class if they are feeling ill. Students will not be punished for missing lecture or lab and every effort will be made to provide the course materials that they missed.

Course Structure:

- A weekly course outline with important tasks, dates and deliverables will be posted at the beginning of each course week.
- This course will actively use the Moodle course software. All course materials and grades will be posted on it. Any pre-made lecture material will be posted on Moodle the night before lecture and my lecture notes will be uploaded onto Moodle following lecture.

- A checklist of daily reading assignments and assignments will be posted online for each exam module.
- A set of learning objectives for each exam will be posted online. All questions from the exams and problem sets will cover topics listed in the objectives
- Homework assignments will have deadlines. Some flexibility in there deadlines can be granted, but it would preferable if the student notifies the instructor ahead of the deadline rather than after.

Other Resources:

You will to use Panopto to view videos from time-to-time. For detailed information about using these resources, see the online help guides:

[Panopto Support for Viewing Videos](#)

Online Etiquette or Netiquette:

Rose-Hulman expects its students to be responsible adults and to behave at all times with honor and integrity. Therefore, please keep in mind:

- Images need to be professionally appropriate. As noted in the Student Handbook, the display of sexually suggestive objects or pictures constitutes harassment of others who can see the images. Others will see your laptop background picture, avatar, etc., so choose appropriate images.
- Electronic messages, forum postings, questions, etc. need to be truthful, respectful, and polite. Rose-Hulman's policy for responsible use of computing facilities notes that sending fraudulent, harassing, or obscene messages and/or materials electronically is unethical and may be illegal. Please review the core rules of Netiquette ('Network etiquette,' or rules for polite interactions online) in preparation for this course.
- Humor doesn't always translate well into electronic communications. Something that was intended as funny or sarcastic can be interpreted literally, causing misunderstandings. "Humor" that belittles or calls into question the competencies of others a) isn't actually funny, and b) translates especially badly into electronic form, where it can easily be interpreted as harassment or bullying.
- Nearly everything that you do in Moodle, the Institute's Learning Management System, is automatically logged and easily trackable by instructors. Through Moodle, instructors can see exactly when you submitted an assignment, whether or not you watched an instructional video, and whether or not you looked at course materials posted online.
- If you are a recipient of or a witness to any kind of harassment or bullying, either online or in person, please tell your instructor immediately.

3.1. Accessing Textbook and Mastering Chemistry Homework Website

To Start: Get the Access Code from VitalSource

The MasteringChemistry software will provide you access to the eBook version of our textbook and to your homework problems for this course.

The Mastering link is accessible once you have clicked on the [VitalSource link](#) in order to reveal an access code. You will only need to enter the access code on your first visit to the Mastering software. If you choose to Opt-out of using the eBook via the Mastering software, then you have one week from start of class to click on the Opt-out option via the [VitalSource link](#). Keep in mind that the Mastering software is integrated throughout this course and a portion of your grade is dependent on your interaction within the Mastering software.

[Inclusive Access FAQ](#) is provided by the Rose-Hulman bookstore and can be referenced regarding payment and access.

Once you have the access code, click on the Mastering Chemistry (MC) link.

- If you already have an RHIT-related Pearson account, you should just be able to click through and join the course.
- If you **don't** already have an RHIT-related Pearson account, you'll need to create a new account. I recommend using your RHIT username as your username for ease of remembering. This account should be used for **all** of your Mastering courses at Rose-Hulman; you **do not** need separate accounts for separate courses.

3.2. Course Schedule

Module/Week	Topic	Activities	Due Dates
Course Introduction & Administration	Course Policies and Schedule	Introduction to Mastering Chemistry Exercise	9/12
Lab Activities		Pre-lab quizzes post lab reports	due every Wednesday
Exam 1 Module	Atomic Structure & Bonding	MC Exercise #1 Quiz 1 Nomenclature Quiz Exam 1	9/13 9/13 9/17 9/19
Exam 2 Module	Reactions and Stoichiometry	MC Exercise #2 Quiz 2 MC Exercise #3 Quiz 3 Exam 2	9/27 9/27 10/4 10/4 10/7
	Thermochemistry	MC Exercise #4 Quiz 4 MC Exercise #5	10/18 10/18 10/25

Exam 3 Module	and Solutions	Quiz 5	10/25
		Exam 3	10/28
Exam 4 Module	Kinetics and Equilibrium	MC Exercise #6	11/8
		Quiz 6	11/8
		Exam 4	11/14

4. Lab Policies

Required Material

- **Personal Protective Equipment:** Goggles and face masks are required personal protective equipment for this lab. Disposable masks will be provided at the beginning of the lab if desired, but you must provide your own goggles. Safety glasses may be worn if the goggles are not feasible with a face mask.
- **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. We can figure out how to deal with the absence.

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

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%

Grade Weights per Category:

Exams	55%
Problem Sets and Quizzes	20%
Lab	25%

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.

It is expected that any work submitted for assessment represents the intellectual work of the individual(s) submitting the work. Any attempt to pass off the intellectual work of another (including the work generated by Large Language Models like ChatGPT) as their own or without proper attribution is an example of academic misconduct and is subject to the penalties described in the Rose-Hulman Academic Rules and Procedures and Student Handbook documents.

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.

Student Well-Being and Academic Success

Rose-Hulman cares about the well-being of every student. Stress is a normal part of the college experience and is often compounded both by classwork and unexpected challenges outside the

classroom. I encourage you to reflect on how you take care of yourself throughout the term, especially before the demands of exams and projects reach their peak. You can reach out to the [Learning Center](#), [Student Academic Success](#) or the [Student Counseling Center](#) (which offers both online and in-person resources) if you would like assistance. Additional resources to help maintain your work-life balance can be found on the [Campus Life](#) web page and within the [Student Success Guide](#). If you, or someone you know, is struggling, you can let us know through the [Rose Cares](#) system, and someone will reach out.

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](#).