

Chem031C: General Chemistry I, 4.0 credits

Fall 2021 Lecture

MWF 12:00 – 12:50, Innovation E102

Fall 2021 Laboratory

Each of you should have a 3 hour lab section scheduled, please check your schedule.

Instructor

Prof. Matt Liptak

Innovation E336

(802) 656 – 0161

matthew.liptak@uvm.edu

Instructor Office Hours

M, 7-8 pm, Microsoft Teams

T, 1-2 pm Innovation E336

R, 11am-12 pm, Innovation E336

All other times by appointment only (matthew.liptak@uvm.edu). If you are requesting an appointment, it should be because you have a scheduling conflict with office hours.

Teaching Assistant Office Hours

Every teaching assistant for every laboratory section of Chem031 has one hour of office hours per lab section per week. These office hours are open to all Chem031 students, not just those in a particular lab section.

General Education Requirements

This course does *not* satisfy any general education requirements

Chem031 does partially satisfy the *College of Arts and Sciences* **Natural Sciences** distribution requirement.

Chem031 is part of the “general chemistry first” tracks of the **Chemistry** and **Biochemistry** majors.

Course Description

First semester of a two-semester sequence. Topics include matter, stoichiometry, gas laws, thermochemistry, quantum theory, atomic structure, electronic configurations, bonding and intermolecular forces.

Course Learning Objectives

Upon completion of Chemistry 031, it is anticipated that you will:

1. Understand how to use the scientific method to solve a problem.
2. Employ the periodic table to predict chemical properties.
3. Balance a comprehensive range of chemical reactions.
4. Use thermodynamics and quantum mechanics to formulate reasonable hypotheses.
5. Describe chemical bonding using molecular orbitals.

Textbook

Tro, N.J. *Chemistry: Structure and Properties*, 2nd Ed., Pearson, 2018
Mastering Chemistry, Online resource, Pearson.

There are four options to purchase the textbook and Mastering Chemistry online access.

- 1) Online bookstore (~\$300; text and mastering).
- 2) At the UVM bookstore (~\$160; text, solutions manual, and mastering).
- 3) Digital access (~\$120; etext and mastering).
- 4) Purchase a used textbook and MasteringChemistry (~\$75 mastering separately).

In my opinion, the best deal is the UVM bookstore package (option 2). The same textbook and online resource will also be used for Chem032: General Chemistry II.

Web Content

Homework problems and weekly quizzes will be available through the *Mastering Chemistry* portal. Lecture notes will be available through *Blackboard* (bb.uvm.edu). You must purchase *Mastering Chemistry* to have access to the homework and quizzes. The Blackboard materials are available for all current, UVM-affiliated, students, but they may not be shared off-campus without permission of the instructor.

Attendance Policy

I do not take attendance in Chem031, but you are responsible for all material covered in lecture. If you miss lecture for any reason, it is **your** responsibility to catch-up on missed material either through reviewing lecture notes posted to Blackboard or by meeting with another student in the course.

Grading

Your grade will be based upon three mid-semester exams (37.5%), a final exam (25%), laboratory (25%), and quizzes (12.5%). If one of your mid-semester exam grades is lower than your final exam grade, I will replace that mid-semester exam grade with your final exam grade. Details regarding the exam and quiz grades can be found in this syllabus. For laboratory grading, you should refer to your laboratory syllabus.

Quizzes

A total of 12 open-book, open-notes quizzes will be administered via *Mastering Chemistry* throughout the semester. In general, quizzes will become available on the *Mastering Chemistry* website at 1 pm on the days when we complete a lecture in class, they will be due at 12 pm on the day of our next lecture, and the answers will become available at 1 pm on the same day as they are due. Thus, **no extensions will be granted** for the quizzes, but your lowest two grades out of the 12 quizzes will be dropped to accommodate excused and unexcused absences. The lecture calendar notes the day when a quiz will become *available*. A more detailed table is available here:

Chapter Quiz	Available (1 pm)	Due (12 pm)	Answers (1 pm)
E	Wed. Sep. 1	Fri. Sep. 3	Fri. Sep. 3
1	Fri. Sep. 10	Mon. Sep. 13	Mon. Sep. 13
2	Fri. Sep. 17	Mon. Sep. 20	Mon. Sep. 20
3	Mon. Sep. 27	Wed. Sep. 29	Wed. Sep. 29

4	Mon. Oct. 4	Wed. Oct. 6	Wed. Oct. 6
5	Fri. Oct. 15	Mon. Oct. 18	Mon. Oct. 18
6	Fri. Oct. 22	Mon. Oct. 25	Mon. Oct. 25
7	Fri. Oct. 29	Mon. Nov. 1	Mon. Nov. 1
8	Fri. Nov. 5	Mon. Nov. 8	Mon. Nov. 8
9	Fri. Nov. 12	Mon. Nov. 15	Mon. Nov. 15
10	Wed. Dec. 1	Fri. Dec. 3	Fri. Dec. 3
11	Mon. Dec. 6	Wed. Dec. 8	Wed. Dec. 8

Exams

Four exams are schedule for Chem 031 on **September 20, October 18, November 15, and December 16**. The first three, mid-semester, exams are *not* cumulative. The final exam *is* cumulative and worth twice as many points as one of the mid-semester exams. All examination times were blocked off in your schedule when you registered, so there are no scheduled make-up dates. The mid-semester Exams are written to take 1.5 hours to compete, but every student has a full 3 hours to take the exam. Since double time is already built into the exam schedule, ACCESS accommodations for extended time do not apply. Only non-programmable, non-graphing calculators are permitted for these exams. You will not be allowed to use cell phones, laptops, tablets, or any programmable devices on exams. Students caught with any other electronic devices will receive a grade of **zero** for the exam.

The first three mid-semester exams will take place from **6:40 – 9:40 pm** on **September 20, October 18, and November 15**. The location will depend upon your laboratory section (all six lecture sections will take the same mid-semester exams):

L01-L11 Innovation E102	L44-L50 Fleming 101	LZ24-LZ31 Rowell 103
L12-L23 Billings I101	L51-L54 Lafayette L108	LZ32-LZ37 Williams 301
L24-L31 Rowell 103	LZ01-LZ04 Innovation E105	LZ38-LZ43 Votey 105
L32-L37 Williams 301	LZ05-LZ11 Innovation E102	LZ44-LZ50 Fleming 101
L38-L43 Votey 105	LZ12-LZ23 Billings I101	LZ51-LZ52 Lafayette 108

The final exam will take place from **10:30 am – 1:15 pm** on **December 16** in **Innovation E102** for all students in this lecture section.

Diversity and Inclusion

I strive to create a classroom environment that supports students from a diverse set of backgrounds. Our society is composed of individual from diverse ethnic, socioeconomic, and educational backgrounds. Half of our society are women. I strongly believe that our best path forward to a stronger and more equitable society is to promote inclusiveness.

It is my expectation that every member of this class will also support diversity and inclusion. As a community, we should strive to uphold the ideals of Our Common Ground:

<https://www.uvm.edu/president/our-common-ground>

I welcome any suggestions as to how I can promote a diverse and inclusive classroom.

The instructor reserves the right to change everything, with notice

Intellectual Property Statement/Prohibition on Sharing Academic Materials:

Students are prohibited from publicly sharing or selling academic materials that they did not author (for example: class syllabus, outlines or class presentations authored by the professor, practice questions, text from the textbook or other copyrighted class materials, etc.); and students are prohibited from sharing assessments (for example homework or a take-home examination). Violations will be handled under UVM's Intellectual Property policy and Code of Academic Integrity.

Course Evaluations

All students are expected to complete course evaluations in-class on **December 10**. The evaluations will be anonymous and confidential. The information gained from these evaluations will be used to iteratively improve Chem031 for future *UVM* students.

Lecture

Tentative Lecutre Schedule			
	Monday	Wednesday	Friday
Aug. 30	Units (E.1-2,E.5-6)	Measurement (E.3-4,E.7-9)	Scientific Method (1.1-1.5)
		Chapter E Quiz	
Sep. 6	Labor Day	Atomic Structure (1.6-1.8)	Molar Mass (1.9-1.11)
	No Class		Chapter 1 Quiz
Sep. 13	Nature of Light (2.1-2.2)	Nature of Electrons (2.3-2.4)	Hydrogen Atom (2.5-2.6)
			Chapter 2 Quiz
Sep. 20	Exam #1 Review	Aufbau Principle (3.1,3.3-4)	Atomic Size (3.2,3.5-6)
	Exam #1 (Ch. E-2)		
Sep. 27	Ionization (3.7-3.9)	Ionic Bonding (4.1-4.6)	Covalent Bonding (4.7-4.8)
	Chapter 3 Quiz		
Oct. 4	Chemical Formulas (4.9-4.12)	Polyatomic Molecules (5.1-5.3)	Fall Recess
	Chapter 4 Quiz		No Class
Oct. 11	Resonance (5.4-5.6)	VSEPR (5.7-5.8)	Molecular Geometry (5.9-5.10)
			Chapter 5 Quiz
Oct. 18	Exam #2 Review	Valence Bond Theory (6.1-6.3)	MO Theory (6.4-6.5)
	Exam #2 (Ch. 3-5)		Chapter 6 Quiz
Oct. 25	Intermolecular Force (11.1-11.4)	Stoichiometry (7.1-7.4)	Combustion Reactions (7.5-7.6)
			Chapter 7 Quiz
Nov. 1	Precipitation Reactions (8.1-8.5)	Acid-Base Reactions (8.6-8.7)	Redox Reactions (8.8-8.9)
			Chapter 8 Quiz
Nov. 8	Thermodynamics (9.1-9.4)	Enthalpy (9.5-9.7)	Hess's Law (9.8-9.11)
			Chapter 9 Quiz
Nov. 15	Exam #3 Review	Pressure (10.1-10.3)	Gas Laws (10.4-10.6)
	Exam #3 (Ch. 6-9)		
Nov. 22	Thanksgiving Recess	Thanksgiving Recess	Thanksgiving Recess
	No Class	No Class	No Class
Nov. 29	Partial Pressure (10.7-10.9)	Real Gases (10.10-10.11)	Phase Changes (11.5-11.7)
		Chapter 10 Quiz	
Dec. 6	Phase Diagrams (11.8-11.9)	Crystalline Solids (12.1-12.4)	Exam #4 Review
	Chapter 11 Quiz		Course Evaluations
Dec. 13		Thursday, December 16	
		Exam #4 (Cumulative)	

The lecture schedule may change, any changes from this schedule will be posted to *Blackboard* and noted during lecture.

Laboratory

Laboratory Safety

OSHA-approved safety glasses or goggles, which can be obtained at the UVM bookstore, must be worn at all times when in the laboratory. Contact lenses are *not* permitted in the laboratory, but prescription glasses will fit underneath safety *goggles*. Open-toed shoes are not permitted in the laboratory at any time. ***Any violation of these policies will result in a grade of zero for the experiment.***

Laboratory Preparation

Prior to each laboratory, you should: print out and read a copy the experiment, watch the laboratory demonstration video, prepare your laboratory notebook, and complete the Pre-lab quiz. You must bring the following items with you to each laboratory meeting: safety glasses, laboratory notebook, and print out of the laboratory experiment.

Attendance/Make-up Policy

Laboratory attendance is mandatory, *missing more than two laboratories for any reason will result in an F for Chem031*. Make-up labs will be offered for documented, UVM-approved reasons. Make-up labs will only be available during the *same* week as your lab section *if* space permits. If you need to request a make-up laboratory, you should contact the laboratory supervisor, Christine Cardillo (Christine.cardillo@uvm.edu) *at least* one week in advance of your laboratory section meeting time.

Laboratory Schedule

Laboratories will begin during the third week of classes. During the first week you must: purchase safety glasses from the UVM bookstore or *Discovery Hall* stockroom, and pass the online safety quiz posted to Blackboard.

Aug. 30 – Sep. 3: NO LABORATORY

Sep. 6 – Sep. 10: Labor Day – NO LABORATORY

Sep. 13 – Sep. 17: Check In

Sep. 20 – Sep. 24: Density Determination

Sep. 27 – Oct. 1: Flame Emission Spectra

Oct. 4 – Oct. 8: Periodic Trends

Oct. 11 – Oct. 15: Determination of a Chemical Formula

Oct. 18 – Oct. 22: Molecular Models

Oct. 25 – Oct. 29: Evaporation and Intermolecular Forces

Nov. 1 – Nov. 5: Chemical Reactions

Nov. 8 – Nov. 12: Acid Content of a Food Product

Nov. 15 – Nov. 19: Heat Capacity and Enthalpy

Nov. 22 – Nov. 26: Thanksgiving – NO LABORATORY

Nov. 29 – Dec. 3: Gas Law Determination of Molecular Weight

Dec. 6 – Dec. 10: Check Out

Tips for Success

For those of you that are first-year students, you will find that the learning format in college is significantly different from that of high school. Whereas a course in high school meets every day for nine months, a course in college meets 2-3 times per week for three months. Also, where you probably spent 35-40 hours per week in class at the high school level, you will only spend 15-20 in class at *UVM*. These differences mean that the expectations on your outside of class effort are *much* higher at *UVM* as compared to high school. As a general rule of thumb, the expectation is that you will put in *a minimum of two hours per week per lecture credit hour* of effort into studying outside of class. This adds up to a minimum of 100 hours throughout the semester, and I assure you that this effort will be most effective if distributed throughout the semester rather than crammed into the time periods immediately prior to exams. What should you be doing to most effectively utilize your study time?

Reading: It is *highly* recommended that you reference the lecture schedule and stay ahead of me by reading the text. This will allow you to focus on mastering the most important/challenging concepts during lecture.

Practice Problems: I will post practice problems to the *Mastering Chemistry* site for each chapter. Working through these problems will not only help you master the important concepts, but also prepare you for the quiz format. In addition, there are *many* valuable practice exercises, problems, and quizzes (with answers!) in the text book.

Review Notes: I will post all of my lecture notes to Blackboard immediately following lecture. I *strongly suggest* that you review these notes shortly after class to ensure that you master the material.

I need help! If you are struggling with any concept presented in class, you should not hesitate to seek out additional help sooner rather than later. Fortunately, you have *many options*:

Instructor Office Hours: My office hours are your drop-in time for Chem031 assistance. These three hours per week are fully dedicated to Chem031 students.

Instructor E-mail: I will respond to all e-mails within one working day (weekdays that are not official UVM administrative holidays). Please do not expect an immediate response to e-mail. In general, the fastest way to get in touch with me is to attend office hours.

Teaching Assistant Office Hours: Every teaching assistant for every section of Chem031 has one hour of office hours per lab section per week. These office hours are open to all Chem031 students, not just those in a particular lab section. Since there are 54 laboratory sections, this means that there are 54 additional hours throughout the week where you can get help!

Supplemental Instruction (SI): Yet more out of class help is available through the Supplemental Instruction program. There will be weekly review sessions and office hours available where you can get assistance from the Chem031 SI leader.

Learning Co-Op: If you prefer an individualized tutor, the Learning Co-Op organizes this relationship for students. Please contact the Learning Co-Op directly in order to be put in touch with a potential tutor.

University-wide Policies and Procedures

Student Learning Accommodations

In keeping with University policy, any student with a documented disability interested in utilizing accommodations should contact SAS, the office of Disability Services on campus. SAS works with students and faculty in an interactive process to explore reasonable and appropriate accommodations, which are communicated to faculty in an accommodation letter. All students are strongly encouraged to meet with their faculty to discuss the accommodations they plan to use in each course. A student's accommodation letter lists those accommodations that will not be implemented until the student meets with their faculty to create a plan.

Contact SAS:

A170 Living/Learning Center;

802-656-7753;

access@uvm.edu

www.uvm.edu/access

Religious Holidays

Students have the right to practice the religion of their choice. If you need to miss class to observe a religious holiday, please submit the dates of your absence to me in writing by the end of the second full week of classes. You will be permitted to make up work within a mutually agreed-upon time. <https://www.uvm.edu/registrar/religious-holidays>

Academic Integrity

The policy addresses plagiarism, fabrication, collusion, and cheating.

<https://www.uvm.edu/policies/student/acadintegrity.pdf>

Grade Appeals

If you would like to contest a grade, please follow the procedures outlined in this policy:

<https://www.uvm.edu/policies/student/gradeappeals.pdf>

Grading

For information on grading and GPA calculation, go to <https://www.uvm.edu/registrar/grades>

Code of Student Conduct

<http://www.uvm.edu/policies/student/studentcode.pdf>

FERPA Rights Disclosure

The purpose of this policy is to communicate the rights of students regarding access to, and privacy of their student educational records as provided for in the Family Educational Rights and Privacy Act (FERPA) of 1974.

<http://catalogue.uvm.edu/undergraduate/academicinfo/ferparightsdisclosure/>

Promoting Health & Safety

The University of Vermont's number one priority is to support a healthy and safe community:

The instructor reserves the right to change everything, with notice

Center for Health and Wellbeing

<https://www.uvm.edu/health>

Counseling & Psychiatry Services (CAPS)

Phone: (802) 656-3340

C.A.R.E.

If you are concerned about a UVM community member or are concerned about a specific event, we encourage you to contact the Dean of Students Office (802-656-3380). If you would like to remain anonymous, you can report your concerns online by visiting the Dean of Students website at <https://www.uvm.edu/studentaffairs>

Final Exam Policy

The University final exam policy outlines expectations during final exams and explains timing and process of examination period. <https://www.uvm.edu/registrar/final-exams>

Statement on Alcohol and Cannabis in the Academic Environment

As a faculty member, I want you to get the most you can out of this course. You play a crucial role in your education and in your readiness to learn and fully engage with the course material. It is important to note that alcohol and cannabis have no place in an academic environment. They can seriously impair your ability to learn and retain information not only in the moment you may be using, but up to 48 hours or more afterwards. In addition, alcohol and cannabis can:

- Cause issues with attention, memory and concentration

- Negatively impact the quality of how information is processed and ultimately stored

- Affect sleep patterns, which interferes with long-term memory formation

It is my expectation that you will do everything you can to optimize your learning and to fully participate in this course.