

# CHEM 1450 General Chemistry 2, Section B, Spring 2024

## 1.) Lecture

**Lecturer:** James Zahardis, PhD

**Email:** [James.Zahardis@uvm.edu](mailto:James.Zahardis@uvm.edu)

**Office:** Innovation E329

**Office Hours:** Tues and Thurs 3-5 pm, Fri 12-2 pm (other times by appointment)

**Class Time:** Tues and Thurs 1:15 – 2:30 PM

**Class Location:** Innovation Hall E102

**Textbook:** “**Chemistry: Atoms First, 5<sup>th</sup> Edition**”, (ISBN 978-1-266-28041-2 bound edition; 978-1-266-27039-0, loose-leaf edition) by Julia Burdge and Jason Overby.

**What is covered in Lecture:** We will cover Chapters 13-20 in a linear manner. Topics include solution properties, chemical kinetics, chemical equilibrium, acid-base chemistry, aqueous equilibrium, electrochemistry and nuclear chemistry.

**Lecture.** This will be an **active participation classroom**, with the introduction of new **ideas and solving problems going hand-in-hand**. Prior to beginning a new chapter in lecture, I'll post a set of notes on Brightspace that I will lecture off of for that chapter. You should have these notes available to you at the time of class. I will introduce ideas and then we will immediately work on problems that are both numerical and conceptual (similar to homework and, ultimately, *what may appear on exams*). **I suggest coming to lecture, with the notes available, and *bringing your calculator*, because working along with me might be very helpful to you.**

**Office Hours and Recitations:** If you need to meet me beyond my regular office hours, please email me and we can work on finding a good time for both of us. I will also answer questions to the best of my ability by email. If there is an interest in having recitations, I am open to affording time to that activity.

- **Homework Assignments from the Book:** You are **expected to read all the assigned chapters**. Lists of suggested homework problems will be posted on Brightspace. I do not grade these problems but from experience I believe that **student success in General Chemistry strongly correlates with the effort they make in working problems**. The answers to most assigned problems from the textbook are in the back of the book. *I will also post my handwritten worked solutions for some of the tougher problems from the book.* You should strive to do as many problems as possible, including those assigned as well as those within the chapter. The Worked Examples in the Chapter and practice problems that follow are great for learning this material.
- **Skill-Building Assignments on Brightspace:** I have identified some of the areas and skills (including ‘doing the math’) associated with Chemistry that tend to give students problems in mastering the material. I will provide pre-test and, if needed, post-test worksheets on Brightspace that I call **Skill-Builders** that, as the name implies, **are designed to build skills**. After a few days of being posted online, I will post solutions on Brightspace and/or work the problems in class. While I do not grade these, I think working on these assignments would benefit most students. Please do not wait for me to post solutions to work the problems: try to work them on your own and then check your work with mine and, if needed, make corrections.
- **Test “Wrap-Ups”:** these so-called wrap-ups are questionnaires that will be posted on Brightspace after I hand back exams. They will include questions designed to have you go back over the exam, consider any mistakes that you made and discuss strategies in improving your performance—and if your performance is perfect, sharing with me how you studied! **These wrap-ups will be handed in, assessed for completeness and count for a portion of your grade.**
- **“Is Fusion the Future of Energy?” Project:** This assignment will have a video(s) component, questionnaire and written component and will be based on applying ideas developed in Chapter 20 (Nuclear Chemistry) on advents in nuclear energy. Details will be presented later in the semester.

- **Mid-term Exams:** There are **three mid-semester exams, a near the end of the semester take-home project/exam (see below), and a final exam.** (Exam dates below.) **There are no scheduled make-up dates.** *However, if you must miss an exam due to medical reasons, family emergency or other reasons, contact your Dean's Office and/or the Center for Health and Wellbeing and get an excused absence. In the case of an excused absence, I will allow you to retake the exam up until I return the exams or post the solutions (whichever comes first).* (It typically takes me about 1 week to grade and return the exams, and I typically post results online shortly thereafter.)

If you cannot make-up the exam in that timeframe, **I will be averaging the 3 highest exam scores (including the take-home project/exam) into your total points**—the lowest exam score is dropped, so your missed exam would count as that lowest score.

The 3 mid-term exams are given during **normal lecture time** in our lecture hall (Innovation E102). The exams include **multiple-choice questions** that are designed to assess your basic understanding of general chemistry, ability to perform chemistry calculations, analyze graphic information and other skills we will be developing in this class. There will be **2 to 3 problems that will require to be worked out in detail** and these problems may have multiple parts. The mid-term exams are relatively concise—typically 15 to 20 multiple-choice questions and 2-3 problems to be worked out in detail--and are **designed to be done in 45 minutes or less**. Students that have ACCESS accommodations will take their exams at the Exam Proctoring Center and get the full time recommended by ACCESS. **To get your full time on the exam you would want to start at 1:15 PM, so if you can get to the class on time or a couple minutes early that would be great.** **Calculators are needed for exams.** **I will not allow any access to the internet during the exams so you cannot perform calculations on any phone or laptop or any device that connects to the internet.** No playing music during the exams, including in any type of an earphone or earbud, because that can disturb other students. Tests must be filled out in **blue or black ink**, no pencil or bright colors (hard to grade). Any other details about the midterm exams, both in terms of content or formatting, will be posted on Brightspace well in advance of the

exams. I also reserve the right to modify the format of the exams by my professional judgement.

*All exams except for the final exam will be returned within about 1 week.*

- **Take-Home Project/Exam:** Toward the end of the semester, I will give a comprehensive project/exam that you will have a few days to work on. The purpose of this is to **help you prepare for the final exam**, because (with the exception of Chapter 20, Nuclear Chemistry) these chapters tend to tie together, so if early material is not well understood, subsequent material becomes very difficult to master. The take-home project/exam is designed to aid you in reviewing for the final exam.
  
- **Final Exam.** The final exam time and location is set by the registrar and listed below. The final exam will be approximately twice the length of a mid-term exam, so it will have approximately 30 to 40 questions, all (or mainly) multiple choice. **It will be a comprehensive exam.** All the aforementioned rules regarding taking exams described in the above section are applicable to the final exam. I neither return the final exam nor post a solution key to the exam, but I will post the score on Brightspace. I will retain the exams for 1 year in my office if you want to look at it there if you schedule an appointment with me.

### ■ Exam Locations, dates and times:

All mid-terms are in Innovation E102 during normal lecture times

- Mid-term 1: Tues Feb 13<sup>th</sup>
- Mid-Term 2: Tues March 26<sup>th</sup>
- Mid-Term 3: Tues April 23<sup>rd</sup>
- Take-home Exam/Project: TBA (shortly after Exam 3)
- Final Exam: Fri May 10<sup>th</sup> 1:30 PM to 4:15 PM (E102)

Note: Exam dates are subject to rescheduling as per the discretion of the instructor.

**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>

## 2.) Laboratory

The information on the lab below is presented to consolidate the information on lab and lecture components of this class. Christine Cardillo, Undergraduate laboratory Supervisor, will make a more extensive syllabus for the laboratory portion of the class, which will be available on Brightspace. (Anything described in that syllabus pertaining to labs supersedes what is described below.)

**Required Lab Materials: Safety Glasses, Lab Coat, and Lab Notebook.** All are available in the UVM Bookstore, or can be purchased from their retailer of choice. All the lab procedures will just be posted online on the lab Brightspace pages.

**Lab Attendance Policy:** Students must attend the lab section they are assigned to. If more than two labs are missed, they will receive an F for the entire course. Only the academic dean of a college may grant an incomplete. All unexcused absence will result in a ZERO grade for the missed laboratory experiment. Official documentation of from a dean's office is require for excused absences. If there is a need to reschedule your lab time to one that is not your regularly assigned time you must obtain permission from the **laboratory coordinator, Christine Cardillo (Christine.Cardillo@uvm.edu)**.

**Lab Points:** Lab is worth 250 points (25% of the course grade). Details of the lab points will be presented by Christine Cardillo.

## Lab Schedule:

<b>Spring 2024 Chemistry 1450 General Chemistry 2 Laboratory Schedule</b>			
<b>Week:</b>	<b>Dates:</b>	<b>Lab Schedule:</b>	<b>Work Due:</b>
1	Tue Jan 16 – Fri Jan 19	<b>NO LABS.</b> Review the lab syllabus and schedule. Purchase a Lab Notebook, Safety Glasses, and a Lab Coat before your first laboratory period. Take and <b>PASS</b> the Laboratory Safety Quiz on Brightspace <b>BEFORE</b> your first laboratory period.	
2	Mon Jan 22 – Fri Jan 26	Laboratory Introduction, Lab Safety Review, & Lab Check-In	Lab Safety Quiz
3	Mon Jan 29 – Fri Feb 2	<b>Experiment 1:</b> Molar Mass Det from Freezing Point Depression	Exp 1 Pre-Lab
4	Mon Feb 5 – Fri Feb 9	<b>Experiment 2:</b> Kinetics Iodination of Acetone	Exp 1 Post-Lab Exp 2 Pre-Lab
5	Mon Feb 12 – Fri Feb 16	<b>Experiment 3:</b> Thermodynamics of Hot & Cold Packs	Exp 2 Post-Lab Exp 3 Pre-Lab
6	Mon Feb 19 – Fri Feb 23	<i>Presidents' Day Holiday Monday Feb 19th. (No labs all week)</i>	
7	Mon Feb 26 – Fri Mar 1	<b>Experiment 4:</b> Determination of the Equilibrium Constant	Exp 3 Post-Lab Exp 4 Pre-Lab
8	Mon Mar 4 – Fri Mar 8	<i>Town Meeting Day Recess Tuesday March 5th. (No labs all week.)</i>	
Recess	Mon Mar 11 – Fri Mar 15	Spring Recess (No labs or classes all week.)	
9	Mon Mar 18 – Fri Mar 22	<b>Experiment 5:</b> Thermodynamics of Borax	Exp 4 Post-Lab Exp 5 Pre-Lab
10	Mon Mar 25 – Fri Mar 29	<b>Experiment 6:</b> Acid Neutralizing Potential of Antacids	Exp 5 Post-Lab Exp 6 Pre-Lab
11	Mon Apr 1 – Fri Apr 5	<b>Experiment 7:</b> Acid-Base Equilibrium, pH, and Buffers	Exp 6 Post-Lab Exp 7 Pre-Lab
12	Mon Apr 8 – Fri Apr 12	<b>Experiment 8:</b> Determination of the Solubility Product	Exp 7 Post-Lab Exp 8 Pre-Lab
13	Mon Apr 15 – Fri Apr 19	<b>Experiment 9:</b> Oxidizing Power of Commercial Bleaches	Exp 8 Post-Lab Exp 9 Pre-Lab
14	Mon Apr 22 – Fri Apr 26	<b>Experiment 10:</b> Electrolysis and Electroplating	Exp 9 Post-Lab Exp 10 Pre-Lab
15	Mon Apr 29 – Fri May 3	Laboratory <b>Clean-up</b> & Laboratory <b>Check-Out</b>	Exp 10 Post-Lab

Finals	Mon May 6 – Fri May 10	Final Exams <i>Good Luck!</i>
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### 3.) Point Breakdown and grading

**Total points = 1000** (750 from lecture + 250 from lab)

- **3 Mid-Term Exams and 1 Take-home Project/Exam = 375 Points** (3 x 125 points, with the lowest score dropped of the 4 total)
- **“Is Fusion the Future of Energy?” project = 50 points**
- **Test “Wrap-Ups” = 50 points** (points distributed over 3 post-exam questionnaires)
- **Final Exam = 275 points**
- **Laboratory = 250 points**

**Grading will be on a standard academic scale:** 90-100% is in the A range, 80s is B range; 70s is C range; 60s is D range; below 60 is an F. Delineation within a grade range (e.g., B vs. B<sup>+</sup> vs. B<sup>-</sup>) will be decided by the instructor at the end of the semester, taking into account class score trends and other factors. Any curve, if applied, is at the instructor’s discretion.

#### 4.) Additional Information

Offenses against the Code of Academic Integrity (i.e., cheating) are deemed serious and insult the integrity of the entire academic community. Any suspected violations of the code are taken very seriously and will be forwarded to the Center for Student Ethics and Standards for further investigation.

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

Important Dates: <https://www.uvm.edu/registrar/uvm-academic-calendar-2023-2024>

#### ACCESS Accommodations

Student Learning Accommodations Statement: *In keeping with University policy, any student with a documented disability interested in utilizing accommodations should contact ACCESS, the office of Disability Services on campus. ACCESS works with students to create reasonable and appropriate accommodations via an accommodation letter to their professors as early as possible each semester.*

Contact ACCESS: A170 Living/Learning Center - 802-656-7753 - [access@uvm.edu](mailto:access@uvm.edu).

ACCESS Office: <http://www.uvm.edu/~access/>

Policy on disability certification and student support:

<http://www.uvm.edu/~uvmppg/ppg/student/disability.pdf>

#### Other Resources:

##### Diversity, Equity, and Inclusion Resources

The Division of Diversity, Equity, and Inclusion believes excellence should be inclusive of the entire University of Vermont (UVM) community and is steadfastly committed to this belief. Every day, our Division strives to make our work accessible, affirming, and action-oriented to help ensure excellence is inclusive of everyone. <https://www.uvm.edu/diversity>

##### UVM Prism Center

The Prism Center serves the diverse queer and trans communities at the University of Vermont. We support and empower lesbian, gay, bisexual, transgender and queer students, as well as students whose identities fall in between or expand beyond those categories, and work to create a campus community where people of all sexual and gender identities can thrive.

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

##### Mosaic Center for Students of Color

The Mosaic Center for Students of Color (MCSC) Vision is to create a diverse and rich community of empowered, engaged, and enthusiastic students of color at UVM.

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

##### Interfaith Center

No matter how you make meaning of your life, you are welcome at the Interfaith Center for reflection, spiritual practice, education, and community building.

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

### **Women & Gender Equity Center**

The UVM Women & Gender Equity Center cultivates joyful community while advancing gender equity across identities. We envision a brave, diverse, and equitable learning environment for all members of the UVM community. We strive to provide programming and events that connect our community through the exploration of the intersections of their gender and other identities.

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

## **Important University Policies**

### **Academic Integrity**

Offenses against the Code of Academic Integrity are deemed serious and insult the integrity of the entire academic community. Any suspected violations of the code are taken very seriously and will be forwarded to the Center for Student Ethics and Standards for further investigation. Violations of the Code of Academic Integrity—including any inappropriate collaboration, collusion, cheating, corroboration, plagiarism, or any other related offense—will be fully investigated according to the rules set by the UVM Academic Integrity Office and may be punishable with a score of zero for the assignment in question. Details can be found at <http://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>

### **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 and Safety**

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

**Center for Health and Wellbeing:** <https://www.uvm.edu/health>

**Counseling & Psychiatry Services (CAPS):** Please call 802-656-3340 for assistance.

**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>

**General statement regarding potential changes during the semester:**

<http://catalogue.uvm.edu/>

The University of Vermont reserves the right to make changes in the course offerings, mode of delivery, degree requirements, charges, regulations, and procedures contained herein as educational, financial, and health, safety, and welfare considerations require, or as necessary to be compliant with governmental, accreditation, or public health directives.

**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.

**Student Learning Accommodations**

In keeping with University policy, any student with a documented disability interested in utilizing ADA accommodations should contact Student Accessibility Services (SAS), the office of Disability Services on campus for students. 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 recommended to discuss with their faculty the accommodations they plan to use in each course. Faculty who receives Letters of Accommodation with Disability Related Flexible accommodations will need to fill out the Disability Related Flexibility Agreement. Any questions from faculty or students on the agreement should be directed to the SAS specialist who is indicated on the letter.

**Contact SAS:**

A170 Living/Learning Center;

802-656-7753

[access@uvm.edu](mailto:access@uvm.edu)

[www.uvm.edu/access](http://www.uvm.edu/access)