

CHEM 32B General Chemistry, Spring 2023

1.) Lecture

Lecturer: James Zahardis, PhD

Email: James.Zahardis@uvm.edu

Office: Innovation E329

Office Hours: MWF 12-2 pm

Class Time: TR 1:15-2:30 pm

Class Location: Innovation E102

Textbook: “**Chemistry Structure and Properties, 2nd Edition**”, (ISBN-13 978-0-13-429393-6) by Tro along with **Mastering Chemistry online access**. If you’ve taken Chem31 here at UVM recently you most likely you have all the following materials, but not, here’s some options: 1) The full textbook and mastering can be bought on Pearson’s online site (~\$300; text and mastering), or 2) at the UVM bookstore (~\$160; UVM custom textbook, solutions manual, and mastering), or 3) just digital access (~\$120; etext and mastering) or 4) purchase a used textbook and MasteringChemistry (~\$75 mastering separately). *The digital solutions manual will be provided for free but also comes with the UVM package and has the complete solutions to all the assigned problems.*

Lecture. This will be an active participation classroom, with the introduction of new ideas and problems going hand-in-hand. Prior to beginning a new chapter in lecture, I’ll post a set of notes on Blackboard 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 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.

Assignments: You are expected to read all the assigned chapters. Homework Problems are from the textbook are listed in this syllabus by chapter. The solutions to all assigned problems will be made available. You should strive to do as many problems as possible, including those assigned as well as those within the chapter.

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 Quizzes: There will be ten graded homework quizzes, but only the best 8 will count. These assignments will be available to you once we finish a chapter and will be found at Mastering Chemistry (Go to Blackboard and follow the Mastering Chemistry link). You will have several days to complete the assignment, and it's fair to say that the earlier you start, the better you'll do.

Exams: The exams are scheduled to be on **Monday from 6:40pm-9:40pm. The Exam location depends on your lab section number.** There are no scheduled make up dates. The three Mid-Semester Exams are the same regardless of Chem32 Section, so all Chem32 students are being tested the same. 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 (*double time already provided to all, so ACCESS time accommodations not applicable*). The only exception to this is the Final Exam (ACCESS time accommodations will be allowed). To get your full time on the exam you would want to start before 6:40 pm, as the exam closes right at 9:40 pm. All exams and quizzes can be accessed after their due dates for practice, save for the final exam: final exam will not be distributed. While taking the exams only non-programmable non-graphing calculators are permitted. No other electronic devices are allowed (i.e., no cell phones, mp3 players, ipods, etc.). **Students caught using electronic devices other than a non-programmable non-graphing calculator will receive a zero for the exam.**

Exam Locations (based on your lab section):

L01-L08 and LZ01-LZ08	Innovation E102
L25-L30 and LZ25-LZ30	Williams 301
L09-L12 and LZ09-LZ12	Innovation E105
L31-L36 and LZ31-LZ36	Votey 105
L13-L24 and LZ13-LZ24	Billings I101

Exam Dates*:

Exam 1: **February 6**

Exam 2: **March 6**

Exam 3: **April 17**

Final Exam (TBD): **May 6-12**

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>

(*The instructor reserves the right to change exam dates and policies.)

2.) Laboratory

Lab Manuals: All experiments can be found online on your lab's Blackboard website as individual pdfs. Please make sure you ***print out each experiment and bring it to lab.***

Lab Notebook: A notebook with carbon-less copies is required for recording lab data. All data is to be recorded in ink (not pencil). A carbon-less copy lab notebook can be bought at UVM's bookstore.

Safety Eye Wear: Everyone in the lab must wear OSHA approved (EZ87stamped) safety glasses or goggles once any experimentation has been started. Students not observing this rule will receive a **ZERO** for the experiment, **warnings will not be given.** Safety eyewear can be purchased at the UVM bookstore. ***Contact Lenses are a potential health hazard and can be worn in the laboratory only if no other types of corrective lenses are available. If you have to wear contact lenses then you must wear goggles and please let your TA know.***

Lab Attire: This is a chemistry laboratory so please dress appropriately. It is best to wear full pants and a shirt with at least short sleeves. Shorts and short pants (capris, crops, etc.) are not allowed in the laboratory. Shirts that expose the shoulders, midriff, or back are also not allowed. Proper footwear is also necessary in the laboratory. Full shoes, preferably constructed of leather or other chemically resistant material, should be worn in when in the laboratory. Open-toed shoes, open-backed shoes, and shoes that expose the top or other portions of the foot are

not allowed. **If you arrive at lab in inappropriate attire, you will not be allowed to perform the experiment that day.**

Prior to Start of Lab: Purchase your lab notebook and safety glasses. In your Lab's Blackboard review and complete the Lab Safety and Academic Integrity Modules. Prior to lab print out the experiment. **If you have not purchased or completed these items, you will not be able to begin the lab portion of the course.**

Attendance: Students must attend the lab section they are assigned to. If more than two (2) labs are missed, you will receive an **F** for the course. Only the academic dean of your college may grant an incomplete. An unexcused absence will result in a **ZERO** grade for the laboratory experiment. Official documentation of sickness or a family crisis is required for an excused absence. If there is a need to reschedule your lab time to one that is not your assigned time you must obtain permission from Christine Cardillo (Christine.Cardillo@uvm.edu) a week in advance.

Due to the possibility of increasing COVID cases, we've decided to offer some additional flexibility to students who need to miss more than the allowed two (2) labs over the course of the semester due to unforeseen circumstances. Please do **NOT** attend lab if you have come into close contact with someone who has tested positive for COVID-19 or are showing any symptoms of COVID. If you are ever unsure, refer to [UVM's COVID Guidelines](#) for guidance in determining what to do.

All students must complete a *minimum* of five (5) labs in person, with two (2) labs marked as excused absences. Students will be allowed to make-up an additional three (3) labs remotely during the semester **pending instructor approval for the additional absences**. Students who attend fewer than five (5) in-person labs will automatically fail the course unless they meet the criteria for an incomplete. Students making up labs remotely will be provided with video recordings of the appropriate techniques and sample data to complete the calculations.

For all missed labs, please follow the procedure listed below:

1) Follow all UVM and local COVID guidelines, including testing when symptomatic or identified as a close contact.

2) Contact the lab supervisor, Christine Cardillo (Christine.cardillo@uvm.edu), and their TA as soon as they are aware they will be unable to attend lab. a. In the

subject line of the email, include your last name, the course you are in, and your lab section (e.g., Khemster CHEM032 L99). Please share as much information about the situation as you are comfortable with, especially regarding the reason for and length of your absence

Failure to contact Christine and your TA in a timely fashion (no later than one week after the missed lab) will result in a zero for *any* missed lab

3) Contact your academic dean's office to request dean's office documentation for an excused absence.

4) If your initial absence gets extended, it is your responsibility to repeat steps 2 and 3 and communicate the need for additional flexibility.

Lab Videos: Prior to attending your lab it is mandatory to view the video that accompanies the lab. These videos demonstrate the proper use of new equipment and the safe handling of chemicals. Videos can be found at: https://www.youtube.com/channel/UC8r6fR2K-8xAtsf-_a8edMg.

Laboratory Format: Each laboratory period is scheduled for 2 hours and 45 minutes. This time includes recitation, your TA's pre-lab overview, performing the weekly experiment, lab clean-up, and lastly time for post-lab calculations. When you first arrive to lab you should turn in your pre-lab for the current week's lab, and the post-lab for the previous week's lab. The lab period will start with recitation, where you will work in groups on selected problems relating to both the current lecture and lab content. Recitation is followed by a brief pre-lab overview led by your TA, leading to the start of experimental work. All experimental work will be stopped prior to the end of the laboratory period to allow enough time for lab clean-up and proper waste disposal before leaving the laboratory. Lastly, any time left in the laboratory period should be used to get started on the post-lab calculations. Plan on being in laboratory for the full scheduled time, do not assume that you will be able to leave or get out of lab early every week.

3.) Course Grade

Percent Ranges for Grades:

An approximate correlation between point ranges and grades will be given following each of the exams. You will not be competing with each other for grades in this course: if everyone excels in this class and scores in the "A-range," I will give everyone "A"s for the course. I encourage you all to work together as you study, to help each other learn the material; however, all graded work must be solely your own, so be prepared to work independently to demonstrate your mastery of the material.

How to Calculate Your Points:

1) Class = **750 total points** (75% of grade; exams and homework)

1a) Mid-Semester Exams = **375 points** (125 points/exam)

1b) Homework = **100 points** (12.5 points/assignment)

1c) Final Exam = **275 points**

There are three mid-semester exams (each 125 points) and a final exam (275 points). If your final is your lowest grade, it will count only as one unit. If one of the mid-semester exams is your lowest grade then your final will count as two units. The lowest mid-semester exam grade will be replaced by the percentage on the final. If you are absent from an exam, official documentation of sickness or family crisis is required or you will receive a **ZERO** for the exam. Students with legitimate excuses will be permitted to take the exam early. Except in very unusual circumstances makeup exams will not be administered after the scheduled exam time.

Example 1.	Exam 1	Exam 2	Exam 3	Final
Actual Scores	106.25 (85%)	56.25 (45%)	97.5 (78%)	206.25 (75%)
Counted Scores	106.25 (85%)	93.75 (75%)	97.5 (78%)	206.25 (75%)

Homework Score: 84.0 (84%) Class Points = 503.75 exam + 84.0 homework
Total = 587.75 points

Example 2.	Exam 1	Exam 2	Exam 3	Final
Actual Scores	87.5 (70%)	97.5 (78%)	95.0 (76%)	187.0 (68%)
Counted Scores	87.5 (70%)	97.5 (78%)	95.0 (76%)	187.0 (68%)

Homework Score: 70.0 (70%) Class Points = 467.0 exam + 70.0 homework
Total = 537.0 points

2) **Laboratory = 250 lab points** (25% of grade)

Lab Safety Quiz: Passing grade required **BEFORE** the first lab.

Pre-Lab Questions: (10 x 8 points) 80 points

Technique: (10 x 3 points) 30 points

Post-Lab Calculations & Questions: (10 x 14 points) 140 points

Total Lab Points: 250 points

3) Course Grade Determination

Let's say you earned 200.00 points for the lab. Add up your points from class and lab and then use the chart at the beginning of this section to determine your course grade.

Example 1:

587.75 class points

+ 200.00 lab points

787.75 total points/1000 points = 78.78%

Example 2:

537.0 class points

+ 200.00 lab points

737.00 total points/1000 points = 73.70%

To summarize:

Ex1 + Ex2 + Ex3 + Final + Homework + Lab = Total Points

(Total Points)/1000] x 100 = Total Percent

Academic Integrity

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>

4. Tentative Lecture Schedule and End-of-Chapter Homework

Dates	Chapter	Major Topics	Problems
Jan 17 - 20	Syllabus and 13	Ch 13: Solution Concentration, Temperature Effects, Colligative Properties, Melting and Boiling Points, Osmotic Pressure	Ch13:25,27,29,31,33,35,37,43,45,47,49,51,59,63,65,67,69,71,73,77,79,81,83,85,87,89,93,97,99,101,109,115
Jan 23 - 27	13 and 14	Ch 13 and Ch 14: Chemical Kinetics, Rate Laws, Integrated Rate Laws, Mechanism, Temperature Effects	Ch14:27,29,31,37,41,45,47,53,55,59,65,71,75,77,83,89,91,95,103,105,107
Jan 30 – Feb 3	14		
Feb 6	EXAM 1**	CHAPTERS 13 AND 14	
Feb 6 – 10	15	Ch 15. Chemical Equilibrium, K_c , K_p , and Le Châtelier	Ch15:21,23,27,29,31,33,35,37,39,41,45,47,49,53,55,59,63,65,67,69,71,73,75,79,81,83,89
Feb 13 – 17	15 and 16	Ch 16. Acid-Base Reactions and Equilibria, Conjugate Acid/Conjugate Base Equilibria, Polyprotic acids	Ch16: 31,33,35,37,39,41,45,49,51,55,59,61,65,67,69,71,75,79,81,83,85,87,89,91,95,97,99,101,103,107,109,111,113,115,117,121,123,127,129,133,141
Feb 20 - 24	16		
Feb 27 - Mar 3	16		
Mar 6	EXAM 2**	Chapters 15 and 16	
Mar 6- 10	17	Ch 17. Buffers, Titrations, and Solubility Equilibria	Ch17:25,27,29,31,33,35,39,41,43,45,49,51,53,57,59,61,63,65,67,69,71,75,81,83,85,87,93,95,97,103,105,111,113,115,121,125

Mar 13 - 17	SPRING BREAK!!		
Mar 20 - 24	17		
Mar 27 - 31	17 and 18	Ch 18. Entropy, Gibbs Free Energy, Free Energy and Equilibrium, Standard State and Nonstandard State	Ch18:31,35,37,39,41,45,47,51,53,55,59,61,67,71,73,75,85,87,93,101
Apr 3 - 7	18 and 19	Ch 19. Redox, Cell Potential, Redox and Equilibrium, Batteries, Electrolysis and Corrosion	Ch19:33,35,37,39,41,43,45,47,49,53,57,59,61,63,65,69,71,73,77,83,85,89,97,99,103,105,115,119
Apr 10 - 14	19		
Apr 17	EXAM 3**		
Apr 17 - 21	19		
April 24 - 28	19 and 20	Module20: Radioactivity, Kinetics of Radioactivity, Fusion, Fission, and Binding Energy	Ch20:31,33,35,37,41,45,51,57,61,71,73,81,83,89
May 1 - 5	Catch up or Review		
May 6 - 12	Final Exam	Cumulative (time/location to be revealed)	

** The extent the exams' material depends on how far we get in lecture.

Other Important Dates:**Jan 30: Last Day to Add/Drop course****Feb 20: PRESIDENT'S DAY****Mar 7: TOWN MEETING DAY****Apr 3: LAST DAY TO WITHDRAW FROM COURSE****5. Lab Schedule**

Date	Activity	Lecture Correlation
Jan 17-20	No Lab. Purchase lab notebook and safety glasses. On Blackboard, review lab syllabus and schedule	
Jan 23-27	Lab Check In: On Blackboard, review and complete the Safety Presentation and Safety Quiz	
Jan 30-Feb 3	Experiment 1 Freezing Point Depression	Chapter 13
Feb 6-10	Experiment 2 Iodination of Acetone	Chapter 14
Feb 13-17	Experiment 3 Keq of FeSCN	Chapter 15
Feb 20	President's Day Holiday: No Labs Mon Feb 21	
Feb 27-Mar 3	Experiment 4 Neutralization Power of Antacids	Chapter 16
Mar 6-10	Town Meeting Day Holiday: No Labs	
Mar 13-17	Spring Break Holiday	
Mar 20-24	Experiment 5 Acids, Bases, pH and Buffers	Chapter 16 and 17
Mar 27-31	Experiment 6 K_{sp} of Copper Hydroxide Lecture	Chapter 17
Apr 3-7	Experiment 7 Hot and Cold Packs	Chapter 18
Apr 10-14	Experiment 8 Thermodynamics of Borax	Chapter 18
Apr 17-21	Experiment 9 Oxidizing Power of Bleach	Chapter 19
Apr 24-28	Experiment 10 Electrolysis and Electroplating	Chapter 19
May 1-5	Lab Clean Up and Check Out	
May 2-6	No Lab	

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.*

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

www.uvm.edu/access