CHEMISTRY 208

Summer Semester 2020
Dr. Amanda Thorsen

Course: CHEM 208-01 (30950)
General Chemistry II &
Intro to Inorganic Chemistry
3 Credits

Meetings & Exams: Some Weekdays
8:00am - 9:30am
(Meetings on Zoom)

Instructor: Prof. Amanda Thorsen
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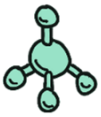
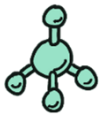
Welcome! **Chemistry 208** is the second half of a two-semester sequence designed to introduce the principles of chemistry. We will be covering a range of introductory topics, including **acid-base chemistry**, **thermodynamics** in chemical reactions, **nuclear chemistry**, the **kinetics** of chemical reactions, and **electrochemistry**, We will also discuss **advanced bonding theories** and introduce the **inorganic chemistry** subfield.

This is an exciting, complex subject, and makes for a challenging course. Our emphasis is on **solving chemical problems**, not just memorizing aspects of chemical behavior. This requires **practice**, strong **mathematical skills**, and the correct use of the **ideas** introduced in Chemistry 103 and this course. The result can be a deeper understanding of the underlying logic, beauty, and simplicity of the natural world.



Pre-requisite: CHEM 103

NOTE: A complementary laboratory course (CHEM 254 or CHEM 256) is offered separately

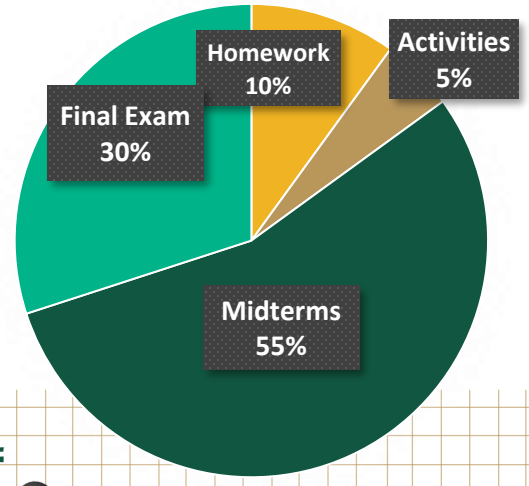


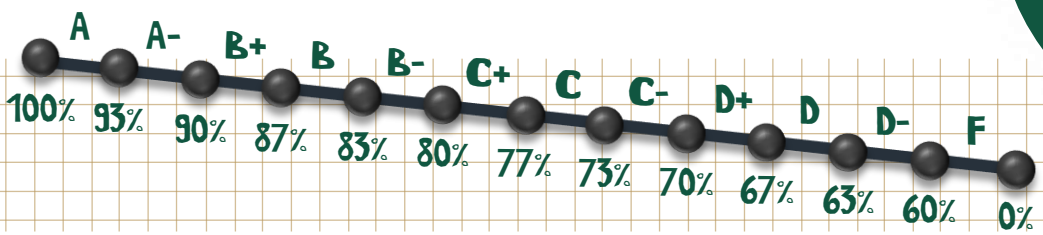
REQUIRED MATERIALS:

❑	**"Chemistry: Atoms First" by OpenStax College**	Free Online: https://openstax.org/details/books/chemistry-atoms-first (You may also choose to purchase a hard copy for $65 on Amazon.)
❑	**"Introduction to Inorganic Chemistry" on Wikibooks & LibreTexts**	Free Online: https://en.wikibooks.org/wiki/Introduction_to_Inorganic_Chemistry
❑	**Paid access to the "Sapling Learning" online homework system**	Registration instructions can be found on our course website on Blackboard. Access can be purchased online for $42, and a 14-Day Free Trial is available.
❑	**Scientific Calculator**	Capable of handling scientific notation, logarithms, and exponents, e.g., TI-30XA. (Note: Other electronic devices are NOT allowed during exams or quizzes)

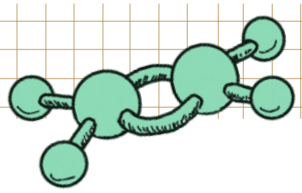
GRADING

There are **3 midterm exams** and one **cumulative final** in this course. In addition, there will be multiple participation **activities** and online **homework** assignments. The weighting for each of these categories is shown in the pie chart on the right. A general guide for a typical overall grade **% → Letter Grade** conversion is shown below. However, depending on overall class performance, final class grades *may* be curved and this scale would then be adjusted as necessary.





COURSE GOALS



A student who has completed the requirements for CHEM 208 will have:

1. Studied the content, principles & methods of chemistry
2. Developed an appreciation for the relevance of chemistry in our daily lives
3. Improved analytical and problem solving skills

These objectives will be accomplished by participation in **class discussions**, rigorous **problem solving**, and **activities** based upon reading material from the assigned text, topics discussed in lecture, and practice problems.

LECTURES

An approximate **schedule** for the material to be covered each week is **included in this document**. **You are responsible for material covered in class AND in the assigned readings** (whether or not it was covered in lecture). Lectures will cover only highlights of the assigned textbook reading material and be broken into short mini lectures **recorded in advance** using **Panopto** and posted to Blackboard under the relevant section for each unit. Recorded lectures can be viewed at any time but will have suggested due dates. Additional Internet videos may also be included as part of the "lecture" content for a unit.

3 MIDTERMS 1 FINAL

The **dates** for the exams are provided in the **course schedule included in this document**. Chemistry knowledge is **cumulative** so questions will often depend on knowledge from earlier chapters.

What happens if I FAIL an exam?

What happens if I MISS an exam?

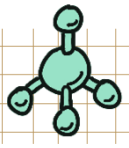
- Missed exam = score of zero on that exam/quiz
- No make-up exams.
- You may arrange for an **excused absence** to avoid a zero.

The final exam is mandatory to pass this course and cannot be excused.

How can I be excused from an exam?

- You must have proof of either an unavoidable, pre-existing conflict, or a legitimate emergency.
- **Prior notice must be given.**
  - Check today & tell instructor **ASAP**.
  - Emergency? E-mail instructor **before** class.

HOMEWORK



This course uses a specialized on-line homework system called **Sapling Learning** (sign-up instructions can be found on Blackboard.) Homework assignments will be posted by chapter with firm deadlines for each assignment. Once the assignment deadline has passed **reduced credit** *may* be available, and the assignment can also still be used for review. Please contact Dr. Thorsen if you complete a homework assignment late and wish to receive partial credit. Additional materials such as textbook readings, videos, and questions will be assigned in class (and on Blackboard) and may count towards your Activities grade but not your Homework grade. Students may work together on homework and activities with the understanding that content mastery is an individual responsibility.

For each lecture, a series of suggested homework problems will be listed from the Sapling homework assignment for that chapter. It is **HIGHLY recommended that you attempt these within 24 hours of viewing the lecture**, but the entire homework set for each chapter will have just **one official due date** after we have finished the chapter. Please contact Dr. Thorsen if you require an extension.

How to Succeed

Mastering problem solving requires **frequent practice** and **exposure** to a variety of different problems and is essential for success in this course.

- Prepare **before** and review **after** lectures by doing suggested reading and practice problems.
- Take chapter notes while reading.
- Practice working **quantitative** AND **conceptual** problems.
- Identify problems you don't understand and **seek help** from classmates or the instructor.
- Maintain a consistent schedule and make sure to get enough sleep.

COURSE POLICIES

Blackboard and Course Communication:

Important information, announcements, and handouts will be posted on **Blackboard** (https://blackboard.wm.edu). Students should check Blackboard and their W&M email accounts regularly to stay informed, at least **daily**. Students can email Dr. Thorsen questions or concerns and should typically receive a response within **24 hours** on weekdays. (Emails sent after 5pm on Fridays may not receive a response until Monday.)

Attendance Policy:

Class attendance is expected for all scheduled class meetings labeled as "**required**" and on scheduled exam dates. If a student is absent more than **20 percent** of scheduled instructional time, attendance may be defined as unsatisfactory. Attendance will be recorded during the **first 10 minutes** of any class meetings using Poll Everywhere. Students are responsible for everything that is covered during class including demonstrations and other visual aids. Students missing class for any reason are expected to get notes from a peer in the class (or review the recording of the class meeting), and check Blackboard for any important announcements they might have missed. If an exam or activity is missed due to an absence, it cannot be made up unless prior arrangements have been made with the instructor. A student who engages in disruptive behavior during class meetings may be asked to leave and will be counted as absent if sent away.

Grade Policy:

When calculating grades, the points for an individual category will be added together and weighted depending upon the percentage of the final grade of each category.

For example, if each homework (HW) is worth 100 points and there are 3 HW assignments; the total points for the "Homework" category is 300 points. If a student scores a 75/100 on the first HW, an 82/100 on the second HW, and an 86/100 on the 3rd HW, they will earn 243/300 points or 81% for the "Homework" category. The "Homework" category is weighted as 10% of the final grade, so this student would receive 8.1 grade points towards their final grade (0.81 x 10 = 8.1).

The weighted grade points from each category are then summed together to give the final grade out of 100 grade points. None of the midterm grades will be dropped from this overall grade calculation. Instead, at the end of the semester your overall grade will be calculated in two ways:

1. The 3 midterm grades contribute equally to the overall 55% in this category (each is worth 18.3% of your overall grade).
2. Your lowest midterm grade is replaced with …
   - a combined score of (½ the points earned on your lowest midterm) + (½ the points earned on your final exam)
   - essentially your lowest midterm would then count as 9.17% of your overall grade and your final exam would then count as 39.17% of your overall grade (instead of 30%)

The highest overall grade from the two methods listed above will be used as your final overall grade in the course.

Letter grades will be assigned to final numerical scores according to the scale on the first page of this syllabus. At the instructor's sole discretion, a higher grade *may* be awarded if the final average for the entire class is subminimum, and/or if the student exhibits regular attendance and rising test scores or a final exam above their semester average.

Final grades are made available to each student on **Blackboard** and **Banner**. Based on the progression of the course, the weighting for each category may change. However, if changes are made, I will notify students in a timely manner and in writing.

COURSE SCHEDULE

This schedule is tentative and subject to change. Any changes will be announced in class and on the course website.

Week	Day	Date	Reading	Lecture Content
1	Mon Tues Wed **Thur***	7/6 7/7 7/8 **7/9**	14.1 –14.7	**Chapter 14 – Acid-Base Equilibria** Acids, Bases, pH Scale, Equilibria, Strength, Neutralization Reactions, Salts, Multiple Equilibria, Polyprotic Acids, Buffers, Henderson-Hasselbalch Equation, Titration Curves, Indicators *** last day to Add/Drop**
	Fri Sat Sun Mon	7/10 7/11 7/12 7/13	15.1 – 15.3 **W 3.1**	**Chapter 15 – Equilibria of Other Reaction Classes** Solubility Product, Selective Precipitation, Common Ion Effect, Lewis Acids & Bases, Multiple Equilibria, pH & Precipitation
	Tues	**7/14**	**8:00 – 9:30 am**	**MIDTERM #1 (Chapters 14 & 15)**
2	Wed Thur Fri	7/15 7/16 7/17	12.1 – 12.4, 13.4	**Chapter 12 – Thermodynamics** Thermodynamics, Enthalpy, Spontaneity, Entropy
	Sat Sun Mon Tues	7/18 7/19 7/20 7/21	16.1 – 16.4, 16.6 – 16.7 **W 4.2-4.3**	**Chapter 16 – Electrochemistry** Electrical Energy, Redox Reactions, Galvanic Cells, Standard Reduction Potentials, Nernst Equation, Concentration Cells, Corrosion, Electrolytic Cells
	Wed	**7/22**	**8:00 – 9:30 am**	**MIDTERM #2 (Chapters 12 & 16)**
3	Thur **Fri*** Sat	7/23 **7/24** 7/25	5.1-5.4	**Chapter 5 – Advanced Theories of Bonding** Valence Bond Theory, Hybridization, Molecular Orbital Theory ***last day to Withdraw**
	Sun Mon Tues Wed	7/26 7/27 7/28 7/29	19.1 – 19.3 **W 3.2** **W 5.1-5.10**	**Chapter 19 – Transition Metals & Coordination Chemistry** Transition Metals, Coordination Compounds, Ligands, Isomerism Crystal Field Theory, Magnetism, Absorption & Color
4	**Thur**	**7/30**	**8:00 – 9:30 am**	**MIDTERM #3 (Chapters 5 & 19)**
	Fri Sat Sun Mon	7/31 8/1 8/2 8/3	17.1 – 17.7	**Chapter 17 - Kinetics** Kinetics, Reaction Rates, Rate Laws, Method of Initial Rates, Integrated Rate Laws, Half-Life
5	Tues Wed	8/4 8/5	20.1 – 20.4	**Chapter 20 – Nuclear Chemistry** Strong Nuclear Force, Radioactivity, Nuclear Reactions Radioactive Decay, Half-Life, Transmutation, Fission, Fusion
	Thur	8/6	Study Day	
	Fri	**8/7**	**8:00 – 11:00 am**	**FINAL EXAM (CUMULATIVE – ALL Chapters above)**

Reading assignments marked with a "W" in dark red are from the Wikibook "Introduction to Inorganic Chemistry"

A more **detailed schedule** will be posted for each chapter on the course website on Blackboard and include due dates for assignments. Please contact Dr. Thorsen ASAP if you have a conflict with any of the exam dates listed in the schedule above.

At least one **required** class meeting per chapter will be held on Zoom from **8:00am to 9:30am on weekdays only**. A tentative schedule for these meetings will be posted on Blackboard prior to the first day of class and the meetings will be recorded. If you will be unable to attend one of these required meetings, please notify Dr. Thorsen at the earliest opportunity. Additional **optional** study sessions and office hours may be scheduled between 8:00am and 5:00pm on any weekday either by Dr. Thorsen or by request. Student requests for additional study sessions or office hours should be made **at least 24 hours (preferably 48 hours) in advance** of when the student would like to meet.

ACADEMIC POLICIES

Academic Integrity:

Cheating in any form will NOT be tolerated.

You have promised that all submitted material is your own original work and is presented in your own words.

The College of William & Mary has had an honor code since at least 1779. Academic integrity is at the heart of the university, and we all are responsible for upholding the ideals of honor and integrity. The student-led honor system is responsible for resolving any suspected violations of the Honor Code, and I will report all suspected instances of academic dishonesty to the honor system. The *Student Handbook* (**www.wm.edu/studenthandbook**) includes your responsibilities as a student. Your full participation and observance of the Honor Code is expected. To read the Honor Code, see **www.wm.edu/honor**.

Students may work with other students on activities and homework, but are required to submit their own answers. Exams will be closed book, closed note and independent. Non-emergency use of a cell phone or other unapproved resources during an exam is grounds for Honor Council proceedings, an F on the exam or an F in the class at the discretion of Dr. Thorsen. Cheating on exams, in any form, **will not be tolerated** and your full participation and observance of the **William & Mary Honor Code** is expected. Students are prohibited from using online resources (internet search engines, Chegg, Bartleby, etc.) during exams and are not allowed to collaborate with other students (or any other person) during exams. At the beginning of each exam, students will be presented with a more detailed version of these exam policies and be **required to acknowledge** that they have read and will adhere to these policies.

Student Accessibility Services:

William & Mary accommodates students with disabilities in accordance with federal laws and university policy. Any student who feels they may need an accommodation based on the impact of a learning, psychiatric, physical, or chronic health diagnosis should contact Student Accessibility Services staff at **757-221-2512** or at **sas@wm.edu** to determine if accommodations are warranted and to obtain an official letter of accommodation. For more information, please see **www.wm.edu/sas**.

If you **anticipate** requiring specific accommodations based on documented disabilities, **please notify me ASAP** (by response to the introductory class survey, an email or personal contact) so that I can make adjustments to minimize their impact on your performance in this class

Success:

I want you to succeed in this course and at William & Mary. I encourage you to come see me during office hours or to schedule an appointment to discuss course content or to answer questions you have. If I become concerned about your course performance, attendance, engagement, or well-being, I *may* speak with you. I also *may* submit a "CARE Report" through our Care Support Services. The referral will be received by the Dean of Students Office as well as other departments when appropriate. Someone will contact you to help determine what will help you succeed. Please remember that this is a means for me to support you and help foster your success at William & Mary.

Academic Support:

The Dean of Students Office offers several Academic Enrichment Programs to assist students. The Tribe TutorZone is a place where peer tutors provide low-fee tutoring services in many subjects. The TutorZone only offers one-on-one tutoring, not group tutoring. Tutoring sessions are held in the Tirbe TutorZone on the first floor of Swem Library, and students should register at least 48 hours in advance by using the TutorZone scheduling website (**https://wm.mywconline.com**). Additionally, small-group workshops designed to help students develop study skills to achieve their academic and personal goals are available in the Brown Board Room of Swem Library, and students should register in advance by using the TutorZone scheduling website (**https://wm.mywconline.com**).