General Chemistry CHEM 112
Spring 2025

Professor: Nicole Crowder
Office: 439 Jepson
Contact: ncrowder@umw.edu, (540)-654-1411
If you have an emergency, you can text me at 540-307-0894.
Lecture: MWF 10:00-10:50am, Jepson 454
Lab: Thurs. 9:30-12:15, Jepson 214

Office Hours: M 11-12, W 1-2, 8-9pm*; Th 8-9pm*; F 9-10 ***evening office hours are on zoom**

Required Materials: Openstax Chemistry (2nd ed., Flowers), subscription to Aktiv, lab coursepack, lab notebook with carbonless duplicate pages, laboratory goggles and lab coat, calculator with scientific notation and exponential functions (you will only be able to use non-graphing calculators on all quizzes and exams. TI-30X calculators are available in the book store).

Web Site: This course will make use of the Canvas course management system. Please check here frequently as materials posted will include course announcements, assignments, lecture videos, and other course materials as necessary. Adjust your notification settings to be sure that you remain up-to-date on the course.

General Education Learning Objectives: This course satisfies the Natural Science General Education requirement. After completing the course, a student should

- Demonstrate understanding of scientific methods that advance scientific knowledge
- Be able to develop explanatory hypotheses for observations, report and display scientific data, and interpret data in a scientifically sound manner
- Use theories and models as unifying principles to understand natural phenomena
- Demonstrate understanding of how scientific methods and resultant knowledge are applied to address specific technological and/or societal challenges

Course-Specific Learning Objectives: Chemistry is everywhere, whether you realize it or not; it can be exciting, useful, or dangerous. After completing the General Chemistry II course, a student should

- Understand the chemical principles governing chemical equilibrium, kinetics, and thermodynamics
- Be able to solve problems related to chemical equilibrium, kinetics, and thermodynamics
- Have gained hands-on experience in the lab and learned how to conduct scientific experiments

I genuinely believe that you can succeed in this course, and I want to enable you to achieve your goals this semester. My goal is to create a learning environment that is inclusive, equitable, and welcoming. If there are aspects of the instruction or design of this course that result in barriers to your participation or academic success, please let me know as soon as possible.

In-Class Behavior: Please act respectfully in class of other students and myself. This includes turning your cell phone, etc. to silent during class time, using electronic devices only for note taking purposes or for team work, and arriving to class on time. You are expected to come to class prepared by actively watching all assigned videos. You are expected to be engaged and participate in all activities. I reserve the right to dismiss you from class if I feel you are acting disrespectfully or are disrupting the class.

Academic Dishonesty: In accordance with the University's Honor Code, all work submitted for grading must be your own and be pledged as such by signing the complete honor pledge at the top of the assignment. I value the community of trust that adherence to the Honor Code affords, and I expect that you will uphold the Honor Code in this course. Therefore, academic dishonesty in any shape or form will not be tolerated.

Suspected violations of the Honor Code ***__including the use of websites/services such as AI, reddit, CourseHero, Chegg, etc., in the completion of any assignments submitted for a grade__*** will be addressed according to the policy established by the Honor Council. Academic dishonesty can result in loss of credit for an assignment, a failing grade in the course, suspension or expulsion from the university, and a notation of an Honor Code violation on your transcript. Please familiarize yourself with the University's policies on academic dishonesty: ignorance is not an excuse!

Disability Resources: The Office of Disability Resources (Seacobeck 005) has been designated by the University as the primary office to guide, counsel, and assist students with disabilities. You will need to request appropriate accommodations through this office as soon as possible, and then make an appointment with me to discuss your approved accommodation needs. I will hold any information you share with me in the strictest confidence unless you give me permission otherwise.

If you have allergies to any chemicals or other emergency medical information, please notify me as soon as possible.

Resources: I want to support you in your overall wellness and in reaching your goals this semester. I know that students sometimes face challenges that can impact academic performance (examples include mental health concerns, food or housing insecurity, personal emergencies). Should you find that you are managing such a challenge and that it is interfering with your coursework, you are encouraged to contact me or the Dean of Students (mjones6@umw.edu) for support and referrals to campus and/or community resources.

How to Succeed in Chem 112:

- **DO PROBLEMS EVERY DAY!!!**
- No, seriously, do problems every day!
- Spend at least one hour per day on chemistry (reading, reviewing notes, **__doing problems__**)
- Actively view all lectures videos, take careful notes, work through the example problems on your own
- Attend all labs and complete the required lab assignments
- Get help from me! (office hours, before/after class, email)
- Attend PASS sessions regularly or seek tutoring through Academic Services or the American Chemical Society tutors
- Review the appropriate sections of the text __before__ class
- Review the appropriate sections of the text __after__ class and organize your notes
- Do the Aktiv problem sets and additional practice problems alone __and__ in groups

Grading:

	Points	Total
Aktiv Problem Sets (best 12 out of 14)	5	60
Team Assignments (best 20 out of 26)	1.5	30
Quizzes (best 8 of 10)	20	160
In-Class Exams (4)	75	300
Laboratory	250	250
Final Exam	200	200
Course Points		1000

Students with a C average or lower will receive a Mid-Semester Deficiency Report.

****A course grade of C or better in CHEM 112 is required to enroll in most upper-level CHEM courses. Please check requirements for other science majors.****

Aktiv: Aktiv is an online learning system that provides an efficient, effective, and engaging learning experience. Each week, you will be responsible for completing a problem set contains problems on concepts that have been covered in lecture. The lowest two problem sets will be dropped.

You are allowed to work on these problems with other students, but you may not copy or plagiarize. Remember that you must work alone on quizzes and exams, so it is in your best interest to be sure ***you*** understand the material. You are not to use internet resources in the completion of these assignments.

Team Assignments: During class time when there is not a quiz or exam scheduled, you will complete assignments as a team that will be submitted at the end of class. The lowest six assignment grades will be dropped. If you are unable to attend a class for any reason, that will be counted as one of your dropped grades. Although the assignments will be posted after class (and you are encouraged to complete them on your own!), team assignments cannot be made up or completed independently for a grade. Teams will be assigned by the instructor and will change periodically during the semester.

Scientific research has shown that working together in teams improves the learning of all participants by at least 10%. When you are working in a team, please be engaged and respectful of your teammates and ensure that everyone on the team understands and agrees to the work on the assignment that is submitted.

Quizzes: A total of ten quizzes will be given throughout the term. Quiz questions will be similar to problems on the team assignments or come from the assigned reading or lecture material. The lowest two quiz grades will be dropped. There will be no make-up quizzes without prior arrangements with me.

Exams: There will be four exams during the semester which will emphasize material introduced since the last exam. You must complete the exam during the designated class period, so be sure to make note of these dates from the course schedule. There will be no make-up exams without prior arrangements with me.

The final exam will be a comprehensive, standardized final written by the American Chemical Society (ACS) that must be taken at the time scheduled by the University: **May 2nd 8:30-11:00am**. According to University policy, any student who does not take the final exam will fail the course. According to ACS policy, there is a 2-hour time limit for the exam, only non-programmable calculators are to be used, and nothing is to be written in the exam booklet (only on the scantron and scratch paper). Writing in the exam booklet will result in a point penalty.

Quiz and Exam Policies: No cell phones or other personal electronic communication devices may be used in the completion of quizzes or exams. *All quizzes and exams are closed note, closed book, and closed internet; communication of any type to anyone either in the course or not is **not** permitted.* You may only use approved non-graphing calculators for ALL quizzes and examinations.

If you feel a mistake has been made in the grading of your exam, you must submit what you wish to be re-graded and why (your reasoning is critical). This must be turned in to me no later than one week after the graded exam is returned.
If you feel there has been a numerical error in calculating your quiz or exam score, please bring this to my attention no later than one week after the graded assignment is returned.

Laboratory: Detailed information regarding the laboratory component of this course can be found in the lab coursepack. It is important to note that due to the nature of the course, ***if a student misses three (3) lab periods, they will fail the course.***

A laboratory practical will be given as the last lab; any student who does not take the laboratory practical will fail the course.

Group work in the laboratory may require a team effort to gather data, **but all calculations, data analysis, and post-lab questions must be completed independently.** You are responsible for your own lab reports. Be sure you can personally justify anything you turn in. All sources used in the completion of lab reports must be appropriately cited and referenced using the ACS citation format.

Reading: Reading of the appropriate sections of the textbook should be done *before* coming to class. You are responsible for this material, *even if it is not covered in lecture.*

Attendance: Attendance in lab is mandatory. Attendance in lecture is highly recommended. Regardless of attendance, all assignments are due on the scheduled date. ***No late assignments will be accepted without my prior consent.***

Absences: You should notify me of an expected absence as early as possible.
Make-up exams will not be given except in the event of EXTREMELY extenuating circumstances.
If you must miss a quiz, see me as soon as possible *prior* to the quiz to arrange a time for a make-up quiz.
Team assignments cannot be made up.
If you must miss a lab, a make-up session may be possible; please see me as soon as possible *prior* to the lab you will need to miss in order to make these arrangements.

PASS Sessions: Peer-Assisted Study Sessions (PASS) are available for this course to assist you in better understanding of the course material. The PASS program provides peer-facilitated study sessions led by qualified and trained undergraduate leaders who attend the lectures with students and encourage students to practice and discuss course concepts in sessions. Sessions are open to all students and will focus on the most recent material covered in class. These sessions are not tutoring but rather sessions to compare class notes, review and discuss important concepts, develop appropriate strategies for studying, and prepare for exams. While attendance is free and voluntary, you may earn two extra credit points a week for attending a PASS session. You must be present and engaged for the entire PASS session to get credit for that session; students who are disruptive will not earn extra credit points.

Course Schedule: The weekly modules in Canvas will as closely as possible adhere to this schedule. The quiz and exam dates are set.

Date	Topic	Chapter	Assignment
Jan. 13	Chemical Kinetics	12	TA1
Jan. 15	Chemical Kinetics	12	TA2
Jan. 17	Chemical Kinetics	12	Q1, A1
Jan. 20	MLK, Jr. Day – NO CLASS	-	
Jan. 22	Chemical Kinetics	12	TA3
Jan. 24	Kinetics/Fundamental Equilibrium Concepts	12/13	A2, Q2
Jan. 27	Fundamental Equilibrium Concepts	13	TA4
Jan. 29	Fundamental Equilibrium Concepts	13	TA5
Jan. 31	EXAM 1	12, 13	A3, EXAM
Feb. 3	Acid-Base Equilibria	14	TA6
Feb. 5	Acid-Base Equilibria	14	TA7
Feb. 7	Acid-Base Equilibria	14	A4, Q3
Feb. 10	Acid-Base Equilibria	14	TA8
Feb. 12	Acid-Base Equilibria	14	TA9
Feb. 14	Acid-Base Equilibria	14	A5, Q4
Feb. 17	Acid-Base Equilibria	14	TA10
Feb. 19	Acid-Base Equilibria	14.7	TA11
Feb. 21	EXAM 2	14	A6, EXAM
Feb. 24	Acid-Base Equilibria	14.7	TA12
Feb. 26	Equilibria of Other Reaction Classes	15	TA13
Feb. 28	Equilibria of Other Reaction Classes	15	A7, Q5
Mar. 3	Spring Break, NO CLASS	-	
Mar. 5	Spring Break, NO CLASS	-	
Mar. 7	Spring Break, NO CLASS	-	
Mar. 10	Equilibria of Other Reaction Classes	15	TA14
Mar. 12	Solutions and Colloids	11	TA15
Mar. 14	Solutions and Colloids	11	A8, Q6
Mar. 17	Solutions and Colloids	11	TA16
Mar. 19	Solutions and Colloids	11	TA17
Mar. 21	EXAM 3	14.7, 15, 11	A9, EXAM
Mar. 24	Thermodynamics	16	TA18
Mar. 26	Thermodynamics	16	TA19
Mar. 28	Thermodynamics	16	A10, Q7
Mar. 31	Thermodynamics	16	TA20
Apr. 2	Electrochemistry	17	TA21
Apr. 4	Electrochemistry	17	A11, Q8
Apr. 7	Electrochemistry	17	TA22
Apr. 9	Electrochemistry	17	TA23
Apr. 11	Electrochemistry	17	A12, Q9
Apr. 14	Electrochemistry	17	TA24
Apr. 16	Electrochemistry	17	TA25
Apr. 18	EXAM 4	16, 17	A13, EXAM
Apr. 21	Nuclear Chemistry	21	TA26
Apr. 23	Nuclear Chemistry	21	Q10
Apr. 25	Research and Creativity Day	-	A14
May 2	FINAL EXAM: 8:30-11am	11-17, 21	FINAL

TA – team assignment; A – Aktiv problem set, Q – quiz

Chem 112 Lab Schedule

	Lab	Assignments Due
1/16	Safety, Policies Volumetric Measurements	Volumetric Measurement Pre-Lab Notebook
1/23	Kinetics	Volumetric Measurements Report Kinetics Pre-Lab Notebook
1/30	Equilibrium	Kinetics Report Equilibrium Pre-Lab Notebook
2/6	Titrations	Equilibrium Report Titrations Pre-Lab Notebook
2/13	Determination of K_a	Titrations Report Determination of K_a Pre-Lab Notebook
2/20	Skills Lab 1	Determination of K_a Report Skills Assignment
2/27	Titration Curve	Titration Curve Assignment
3/6	SPRING BREAK	
3/13	Determination of K_{sp}	Determination of K_{sp} Pre-Lab Notebook
3/20	Colligative Properties	Determination of K_{sp} Report Colligative Properties Pre-Lab Notebook
3/27	Skills Lab 2	Colligative Properties Report Skills Assignment
4/3	Project	Project Report
4/10	Redox	Redox Pre-lab Notebook
4/17	TBD	Redox Report
4/24	Lab Practical	Lab Practical

Last day to drop a course: January 31

Last day to withdraw from a course or change to pass/fail grading: March 21

Title IX Statement

University of Mary Washington faculty are committed to supporting students and upholding the University's *Policy on Sexual and Gender Based Harassment and Other Forms of Interpersonal Violence.* Under Title IX and this Policy, discrimination based upon sex or gender is prohibited. If you experience an incident of sex or gender based discrimination, we encourage you to report it. ***While you may talk to me, understand that as a "Responsible Employee" of the University, I MUST report to UMW's Title IX Coordinator what you share***. If you wish to speak to someone confidentially, please contact the below confidential resources. They can connect you with support services and help you explore your options. You may also seek assistance from UMW's Title IX Coordinator. Please visit UMW's Title IX website to view UMW's policy and to find further information on support and resources.

Resources

Ruth Davison
Title IX Coordinator
Fairfax House

Confidential Resources

On-Campus
Talley Center for Counselling Services
Lee Hall 106
540-654-1053

Student Health Center
Lee Hall 112
540-654-1040

Off-Campus
Empowerhouse
24-hr hotline: 540-373-9373

Rappahannock Council Against Sexual Assault (RCASA)
24-hr hotline: 540-371-1666

Policy on Recording Class and Distribution of Course Materials

Classroom activities in this course may be recorded by students enrolled in the course for the personal, educational use of that student only, and may not be further copied, distributed, published, or otherwise used for any other purpose without the express written consent of the course instructor.

All students are advised that classroom activities may be taped by students for this purpose.

Distribution or sale of class recordings or recorded lecture videos is prohibited without the written permission of the instructor and other students who are recorded.

Any class materials (any document or other item provided by or made available by the instructor to students enrolled, including but not limited to coursepacks, lecture videos, annotated lectures, handouts, laboratory experiments, quizzes, exams, review sheets or past exams) provided for this course (in the coursepack, during class or lab, or posted on Canvas or YouTube) are for the personal, educational use of that student only, and may not be further copied, distributed, published, or otherwise used for any other purpose without the express written consent of the course instructor.

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****Students in violation of any part of this policy are subject to disciplinary action through the Office of Judicial Affairs and Community Standards.****

This policy is consistent with UMW's Policy on Recording Class and Distribution of Course Materials.