General Chemistry: CHEM 112 HN, Section 1
Spring 2025

Instructor: Leanna Giancarlo
Office: Jepson Science Center 436
Contact: lgiancar@umw.edu, (540) 654-1407
Lecture: MWF 11:00 am – 11:50 am, Jepson Science Center 217B
Laboratory: T 12:30 pm – 3:15 pm, Jepson Science Center 416

Office Hours: M 1:00 – 2:30 pm; W 9 – 9:50 am, 1:00 – 2:30 pm; F 2:00 – 3:00 pm; or by appointment

Required Materials:

- Openstax: Chemistry, 2nd edition
- subscription to Aktiv Chemistry – online learning tool; available through the Bookstore or directly from the website (aktiv.com)
- Coursepack for CHEM 112 (section 1)
- lab notebook with carbonless duplicate pages, laboratory goggles and lab coat
- small white board (8.5" x 11"), dry erase markers and eraser
- 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 Bookstore

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, and other course materials as necessary. All lab materials will be posted on Canvas.

Course Description:

General Chemistry is designed so that each student learns the fundamental concepts of chemistry. To do this successfully, problem-solving skills must be practiced and developed. Chemists (and scientists, in general) are in the business of solving problems on a daily basis. By attending lectures faithfully and completing the suggested practice problems, each student can begin to acquire the skills necessary to become a critical thinker. (These same skills are useful in all professional areas, including business, law, medicine, etc.)

Course-Specific Learning Objectives:

After completing General Chemistry II, 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

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

Grading: Grades will be based on the following

	Points	**Total**
Hourly Examinations (4)	80	320
Graded Quizzes (best 5)	10	50
Aktiv	10	130
Laboratory		250
Cumulative Final Exam	250	250
		1000

Students with a lecture grade of 70 or less will receive a midsemester report of unsatisfactory.

A grade of C or better in CHEM 112 is required to enroll in <u>most</u> upper level Chemistry courses.

Extra credit will be awarded for **active** participation in PASS (see below). Students can earn 3 points per week for attendance and active involvement in a PASS section up to a total of 30 points extra credit over the entire semester.

Points to overall grade conversions:

Points accumulated	**Letter Grade**	**Points accumulated**	**Letter Grade**
≥ 930 points	A	929 – 900 points	A-
899 – 870 points	B+	869 – 830 points	B
829 – 800 points	B-	799 – 770 points	C+
769 – 730 points	C	729 – 700 points	C-
699 – 650 points	D+	649 – 600 points	D
below 600 points	F		

Honor System:

All graded work (hourly exams, online exercises, Aktiv Chemistry, extra credit assignments, *graded* assignments, final exam) must be your own; this means you may not use any electronic resources including AI to complete them. Online submission constitutes you abiding by the Honor System and pledging as such. All written work must have the Honor Pledge written in full and your signature. You must use **these** words and sign the pledge: I hereby declare upon my word of honor that I have neither given nor received any unauthorized help on this work.

It is recommended that the *suggested* problems (i.e., not submitted for a grade) be done individually and then with a study group when questions arise. **No late assignments will be accepted**. Please, discuss difficulties with the homework problems or lecture material with me.

Class Attendance:

Class attendance is highly recommended. The material discussed in lecture frequently has a different emphasis from that provided by the textbook. Also, time has been set aside in the course schedule to discuss example problems and practice problem-solving with your peers with instructor guidance. Students are responsible for all covered materials during a missed class. Missed exams and laboratories **will not** be made up except in the event of an excused absence due to an emergency. (Immediate notification of the instructor is mandatory). Lateness to lecture is distracting, and students should attempt to be on time. Lateness to an exam will result in less time allowed for completion of the exam. Cell phones must be turned off prior to entering the classroom and are **prohibited** on examination days

Aktiv Chemistry:

Aktiv is an adaptive, independent learning platform. You will use Aktiv in this course for "weekly" graded homework assignments. Aktiv will help you to

- Review topics and skills that need refreshing
- Practice new material that you are ready to learn
- Review and prepare for exams
- Track your personal performance
- Practice concepts you find difficult (Adaptive Follow Up)

There will be "weekly" assignments worth 10 points each due as indicated on the course calendar below by 11:59 pm or as announced in class. This accounts for 130 points of your course grade.

PASS (Peer Assisted Study Skills):

Extra credit in this course can be earned through attendance at Peer Assisted Study Skills sessions. These hour-long sessions are meant to bolster your study, math and/or chemistry skills. There will be several

sessions held each week; for each weekly attendance (i.e., attending one of the numerous sessions in a given week), you will receive 3 points toward your final grade up to 30 points total. This amounts to attending 10 out of the 13 weeks of the semester. You will not gain the points if you only go to the PASS sessions during the first three weeks of class or the last or only before exams. Your attendance must be more regular for you to benefit. In addition, for you to receive credit (the 3 points), you must be present for the entire PASS session. Students who are disruptive will lose credit for that session; continual disruptions will result in your removal from PASS for the rest of the semester and the denial of any extra credit points associated with your attendance. As an alternate extra credit, in place of PASS, I will give you 1 point per week to attend my office hours with a question/problem you want help with.

Disability Resources:

The Office of Disability Resources has been designated by the university as the primary office to guide, counsel, and assist students with disabilities. If you receive services through the Office of Disability Resources and require accommodations for this class, please provide me a copy of your accommodation letter via email or during a meeting. I encourage you to follow-up with me about your accommodations and needs within this class. I will hold any information you share with me in the strictest confidence unless you give me permission to do otherwise.
If you have not made contact with the Office of Disability Resources and have reasonable accommodation needs, their office is located in Seacobeck 005, phone number is (540) 654-1266 and email is odr@umw.edu. The office will require appropriate documentation of disability.

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.

Class Recordings and 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.

Distribution or sale of any and all 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) is prohibited without the written permission of the instructor. Distribution without permission is a violation of copyright law.

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

Basic Needs Security:

Learning effectively and engaging wholly in class is dependent upon our basic security and having our fundamental needs met: having a safe place to sleep at night, regular access to nutritious food, and some assurance of safety. If you have difficulty affording groceries or accessing sufficient food to eat every day, or if you lack a safe and stable place to live, please contact Chris Porter, Assistant Dean of Students, at cjporter@umw.edu. Additionally, the Gwen Hale Resource Center is a free resource on campus, providing food, toiletries and clothing to any member of our community. It is open Monday, Tuesday and Friday from 1pm-6pm, on the 5th floor (floor A for Attic) of Lee Hall, or resource@umw.edu . Finally, you are always welcome to talk with me about needs, if you are comfortable doing so. This will enable me to provide any resources I may possess.

Other "helpful" information:

The tentative schedule that follows is how I see the course arranged. It is not concrete. If there is material that you, as a class, find confusing, we will spend more time on that topic. The exam dates will remain set according to the schedule. If all of the "scheduled" material has not been presented prior to the exam, the exam will include only what has been covered.

How to Succeed:

Success in chemistry requires considerable work on your part. Successful students typically spend a minimum of 1 hour per day on chemistry. This time is devoted to reviewing notes, **attempting the suggested/assigned problems** and reading ahead for the next lecture. Some of their "secrets" include (but are not limited to)

- reading the material prior to class.
- attending the lectures.
- taking good notes.
- asking questions. (The only "stupid" question is the one that goes unasked.)
- solving the suggested problems (and ALEKS) for each chapter. (Attempting extra problems is also a great idea. "Practice makes permanent.")
- attending PASS
- consulting your peers when you are struggling with the solution to a suggested problem. (First, they may have a different slant or see the problem in a different light. Second, scientists typically work in teams. Each member of the team is responsible for a particular aspect of the problem; therefore, each scientist must understand what each of the other members of the team does and have requisite background knowledge.)
- enlisting the aid of the instructor (office hours or appointments, before/after class).
- reviewing the appropriate sections of the text and all notes after class.
- attempting all suggested and assigned problems by yourself

Course Outline:

Topic	**Chapters/Sections**
Chemical Kinetics	Chapter 12
Chemical Equilibrium Fundamentals	Chapter 13
Chemical Equilibrium: Acids and Bases	Chapter 14.1-14.6, 15.1 (common ion), 15.2 (Lewis acid/base)
Advanced Acids and Bases (titrations)	14.7
Chemical Equilibrium: Solubility and Aqueous Ionic Equilibria	Chapter 15.1, 15.3, 15.2 (complex ions)
Solutions	Chapter 11
Free Energy and Thermodynamics	Chapter 16

Topic	Chapters/Sections
Electrochemistry	Chapter 17
Nuclear Chemistry	Chapter 21

Cumulative ACS Final Exam: Monday, April 28, 2025, 12:00 – 2:30 pm

Lecture Schedule:

1/13 Chemical Kinetics Chapter 12	1/15 Chemical Kinetics Chapter 12	1/17 Chemical Kinetics Chapter 12 Aktiv #1
1/20 Martin Luther King, Jr. Day NO CLASS	1/22 Chemical Kinetics Chapter 12	1/24 Chemical Kinetics Chapter 12 Aktiv #2
1/27 Chemical Kinetics Chapter 12	1/29 Chemical Equilibrium Chapter 13	1/31 Chemical Equilibrium Chapter 13 Aktiv #3
2/3 Chemical Equilibrium Chapter 13	2/5 Chemical Equilibrium Chapter 13	2/7 **Exam 1** Aktiv #4
2/10 Acids and Bases Chapter 14	2/12 Acids and Bases Chapter 14	2/14 Acids and Bases Chapter 14 Aktiv #5
2/17 Acids and Bases Chapter 14	2/19 Acids and Bases Chapter 14	2/21 Aqueous Ionic Equilibrium Chapter 15 Aktiv #6
2/24 Acids and Bases Chapter 14	2/26 Acids and Bases Chapter 14	2/28 Acids and Bases Chapter 14 Aktiv #7
3/3 Spring break NO CLASS	3/5 Spring break NO CLASS	3/7 Spring break NO CLASS
3/10 Aqueous Ionic Equilibrium Chapter 15	3/12 Aqueous Ionic Equilibrium Chapter 15	3/14 **Exam 2** Aktiv #8
3/17 Aqueous Ionic Equilibrium Chapter 15	3/19 Aqueous Ionic Equilibrium Chapter 15	3/21 Aqueous Ionic Equilibrium Chapter 15 Aktiv #9
3/24 Aqueous Ionic Equilibrium Chapter 15	3/26 Solutions Chapter 11	3/28 Solutions Chapter 11 Aktiv #10
3/31 Solutions Chapter 11	4/2 Thermodynamics Chapter 16	4/4 **Exam 3** Aktiv #11
4/7 Thermodynamics Chapter 16	4/9 Thermodynamics Chapter 16	4/11 Electrochemistry Chapter 17 Aktiv #12

4/14 Electrochemistry Chapter 17	4/16 Electrochemistry Chapter 17	4/18 Radioactive and Nuclear Chemistry Chapter 21 Aktiv #13
4/21 **Exam 4**	4/23 Radioactive and Nuclear Chemistry Chapter 21	4/25 Research and Creativity Day Aktiv #14 (extra credit)

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