

General Chemistry CHEM 111
Fall 2024

Instructor: Dr. Adharsh Raghavan (*pronounced Ah-the-ersh Rah-guv-un*)

Office: 433 Jepson (433 JEPS)

Contact: araghava@umw.edu

Office Ph: 540-654-1144

If you have an emergency, text me at 765-637-3026

Lecture: MWF, Jepson 100 (JEPS 100), 2:00–2:50p

Lab: Tuesdays, Jepson 214

Section 5: 9:30a–12:15p, Section 6: 2:00p–4:45p

Office Hours: M 12:30–1:30p*, 3:30–4:30 pm

W 9:30–10:30 am, 12:30–1:30 pm

F 9:30–10:30 am, 12:30–1:30 pm*

* Virtual office hours, 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 in order to remain up-to-date with 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: After completing this course, a student should

- Understand the basis for chemical bonding and reactivity
- Be able to solve problems related to chemical principles
- Understand the models used by scientists to explain observed phenomena
- 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; your feedback helps us both.

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 and completing all pre-lab assignments. You are expected to be engaged and participate in all activities. I reserve the right to dismiss you from class or lab if I feel you are acting disrespectfully, dangerously, 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 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 and ask if you need clarification on the expectations for an assignment: 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.

How to Succeed in Chem 111:

- Spend at least one hour per day on chemistry (reading, viewing videos, 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
- I'm here to help you! (office hours, before/after class, email)
- 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 practice problems alone and in groups
- Most importantly, spend time thinking critically about the course material, and put in your 100% to achieve conceptual clarity.

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 insecurity, homelessness, 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.

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 111 is required to enroll in CHEM 112****

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 that contains problems on concepts that have been covered in lecture. The number of problems may vary from week to week depending on the topics covered. Two problem sets with the lowest grades will be dropped. You are allowed to work on these problems with other students, but you may not copy or plagiarize. You are not to use internet resources in the completion of these assignments. Remember that you must work alone on quizzes and exams, so it is in your best interest to ensure that **you** understand the material.

Team Assignments: During class time when there is not a quiz or exam scheduled, you will complete assignments as a team. Each team will submit one copy of their completed work 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. Since the team assignments contain representative types of problems that you will be expected to know how to do, you should not divide the problems between the team members to complete.

Quizzes: A total of ten quizzes will be given throughout the term. Quiz questions will be similar to problems on the team assignments or will 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: **December 9th, 3:30-6:00 pm**. 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).

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; personal 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 hands-on nature of the laboratory, ***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. You must be able to personally justify anything you turn in. All sources used in the completion of lab reports must be appropriately cited using the ACS citation format (examples provided in lab coursepack).

Reading: Reading of the appropriate sections of the textbook should be done *before* coming to class. You will be 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. 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. Team assignments cannot be made up.

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

CHEM 111 Lecture Schedule

Date	Topic	Chapter	Assignment
Aug. 26	Intro; Matter, Measurement, and Problem Solving	1	
Aug. 28	Matter, Measurement, and Problem Solving	1	
Aug. 30	Atoms, Molecules, and Ions	2	A1, Q1
Sept. 2	LABOR DAY – No class	-	
Sept. 4	Atoms, Molecules, and Ions	2	
Sept. 6	Atoms, Molecules, and Ions	2	A2, Q2
Sept. 9	Composition of Substances, Stoichiometry of Chemical Reactions	3.1-2, 4.1-4	
Sept. 11	Composition of Substances, Stoichiometry of Chemical Reactions	3.1-2, 4.1-4	
Sept. 13	Composition of Substances, Stoichiometry of Chemical Reactions	3.1-2, 4.1-4	A3, Q3
Sept. 16	Composition of Substances, Stoichiometry of Chemical Reactions	3.1-2, 4.1-4	
Sept. 18	Composition of Substances, Stoichiometry of Chemical Reactions	3.3-4, 4.5	
Sept. 20	EXAM 1	1, 2, 3.1-2, 4.1-4	A4, EXAM
Sept. 23	Composition of Substances, Stoichiometry of Chemical Reactions	3.3-4, 4.5	
Sept. 25	Composition of Substances, Stoichiometry of Chemical Reactions	3.3-4, 4.5	
Sept. 27	Composition of Substances, Stoichiometry of Chemical Reactions	3.3-4, 4.5	A5, Q4
Sept. 30	Thermochemistry	5	
Oct. 2	Thermochemistry	5	
Oct. 4	Thermochemistry	5	A6, Q5
Oct. 7	Thermochemistry	5	
Oct. 9	Thermochemistry	5	
Oct. 11	EXAM 2	3.3-4, 4.5, 5	A7, EXAM
Oct. 14	FALL BREAK – No class	-	
Oct. 16	Electronic Structure and Periodic Properties of Elements	6	
Oct. 18	Electronic Structure and Periodic Properties of Elements	6	A8, Q6
Oct. 21	Electronic Structure and Periodic Properties of Elements	6	
Oct. 23	Electronic Structure and Periodic Properties of Elements	6	
Oct. 25	Chemical Bonding and Molecular Geometry	7	A9, Q7
Oct. 28	Chemical Bonding and Molecular Geometry	7	
Oct. 30	Chemical Bonding and Molecular Geometry	7	
Nov. 1	Chemical Bonding and Molecular Geometry	7	A10, Q8
Nov. 4	Advanced Theories of Covalent Bonding	8	
Nov. 6	Advanced Theories of Covalent Bonding	8	
Nov. 8	Advanced Theories of Covalent Bonding	8	A11, Q9
Nov. 11	Advanced Theories of Covalent Bonding	8	
Nov. 13	Gases	9	
Nov. 15	EXAM 3	6-8	A12, EXAM
Nov. 18	Gases	9	
Nov. 20	Gases	9	
Nov. 22	Liquids and Solids	10	A13, Q10
Nov. 25	Liquids and Solids	10	
Nov. 27	Thanksgiving Break – No class	-	
Nov. 29	Thanksgiving Break – No class	-	
Dec. 2	Liquids and Solids	10	
Dec. 4	EXAM 4	9, 10	EXAM
Dec. 6	Review	1-10	A14
Dec. 9	FINAL EXAM 3:30-6:00	1-10	FINAL

Chem 111 Lab Schedule

	Lab	Assignments Due
8/27	Introduction, Lab Policies, and Safety	
9/3	Volumetric Measurements	Graphing Assignment Volumetric Measurement Pre-Lab Notebook
9/10	Skills Lab 1	Volumetric Measurements Report Skills Assignment
9/17	Solution Preparation	Solution Preparation Pre-Lab Notebook
9/24	Stoichiometry	Solution Prep Report Stoichiometry Pre-Lab Notebook
10/1	Skills Lab 2	Stoichiometry Report Skills Assignment
10/8	Thermochemistry	Thermochemistry Pre-Lab Notebook
10/15	NO LAB (Fall Break)	Thermochemistry Report due on 10/16
10/22	Spectroscopy	Spectroscopy Pre-Lab Notebook
10/29	Skills Lab 3	Spectroscopy Report Skills Assignment
11/5	NO LAB (Election Day)	
11/12	Lewis Structures & Molecular Geometry	Lewis Structures & Molecular Geometry Assignment
11/19	Gas Lab	Gas Lab Pre-Lab Notebook *Gas Lab Report due 12/2*
11/26	TBD	
12/3	Lab Practical	Lab Practical

Last day to drop a course: September 13

Last day to withdraw from a course or change to pass/fail grading: November 1

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.

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 recorded 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 express written permission of the instructor.

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****Students in violation of any part of this policy are subject to disciplinary action through the Office of Student Conduct and Responsibility.****

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