Chemistry and Society (CHM 105)

Instructor: Suzanne Moore Nguyen **Office**: Jepson 439 **email**: snguyen3@umw.edu

Course Information:

Lecture: Jepson 225 Tuesday, Thursday 3:30-4:45 pm
Lab: Jepson 210 Thursday 5:00-7:15 pm
Final Exam:

Office hours:

- Monday 1 p.m. – 2 p.m.
- Tuesday 1 p.m. – 2 p.m.

Alternate hours can be arranged – please ask!

Final Exam: Jepson 225

- **Tuesday, December 10: 3:30 – 6:00 p.m**.

According to University policy, any student who does not take the final exam will fail the course.

Course Description:

A study of societal problems and issues involving an understanding of important chemical principles with emphasis on relevant applications and the enhancement of chemical literacy for the non-scientist. This course will explore the fundamentals of chemistry, how chemistry can help address global human health and environmental issues. Provides the student with foundational principles of chemistry including atoms, molecules, chemical reactions, stoichiometry, chemical/physical properties, and periodic table trends. Laboratory. Does not satisfy any major program requirements or serve as a prerequisite to any other chemistry courses. Credits for only one sequence (Chemistry 105-106 or 111-112) can count toward degree requirements. Only in sequence.

1. What do I need?

Positive learning mindset 😊

Required Materials

- *Chemistry in Context – Applying Chemistry to Society*. Fahlman, B., Purvis-Roberts, K., Kirk, J., Kelly, R., and Daubenmire, P. 10th Edition, McGraw Hill, 2021.
- calculator with scientific notation and exponential functions
  - you will only be able to use nongraphing calculators on all quizzes and exams
  - TI-30X calculators are available in the Bookstore.
- Approved safety goggles and laboratory coat for laboratory
- Blue or black ink pen for laboratory

2. Where can I find course materials?

Online: 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.

Please[googleplex] have your notification setting for new Announcements posted to Immediately. I use this to communicate changes, additional materials, extra credit opportunities, and other important information. If this setting is not on, you are going to miss out ☹

3. What am I supposed to be learning?

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 this course, a student should

• 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

• Be able to solve problems related to chemical principles

• Be able to discuss how chemistry can help address global human health and environmental issues

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.

TL,DR: I am here to help, but I can't solve a problem I don't know about. Let's figure it out together.

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.

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

4. How am I supposed to be learning?

In-Class Behavior: Please act respectfully in class of other students and of yourself. This includes turning devices to silent during class time, using electronic devices only for note taking purposes or for teamwork, and arriving to class on time. You are expected to come to class prepared by actively watching all assigned videos. You are expected to participate in all activities.

I reserve the right to dismiss you from class or lab if I feel you are acting in an unsafe manner, being disrespectful, or are disrupting the learning environment for your peers.

How to Succeed in Chem 105

− Spend at least one hour per day working on chemistry *this class is cumulative*
− 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)
− 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

5. What are the rules?

AI statement: AI is permitted in a limited capacity in this course. Students should refer to individual assignments for authorization details as well as how/when appropriate citation for the tool should be used.

Please note:

- AI can be used to clarify concepts and provide examples but is not a replacement for your understanding.
- AI answers are not always correct.
- AI can help you learn, but your own effort is key.
- AI generated answers may not be submitted as your own work.

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!

The Honor Code is important.

Do not submit work that is not your own.

If you have questions, ask.

If you have misjudged the assignment/mismanaged your time, **choose** to send me an email versus cheating. Please.

Policy on Recording Class and Distribution of Course Materials:

In this class, students **may not** make audio or video recordings of any course activity unless the student has an approved accommodation from the Office of Disability Resources permitting the recording class meetings. In such cases, the accommodation letter must be presented to the instructor in advance of any recording being done and all students in the course will be notified whenever recording will be taking place. Students who are permitted to record classes are not permitted to redistribute audio or video recordings of statements or comments from the course to individuals who are not students in the course without the express permission of the faculty member and of any students who are recorded. Distribution without permission is a violation of educational privacy law. This policy is consistent with UMW's *Policy on Recording Class and Distribution of Course Materials.*

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 confidential resources found below. They can connect you with support services and help you explore your options. You may also seek assistance from UMW's Title IX Coordinator, their contact information can be found below.

Please visit http://diversity.umw.edu/title-ix/ to view UMW's Policy on Sexual and Gender Based Harassment and Other Forms of Interpersonal Violence and to find further information on support and resources.

Title IX Coordinator: Ruth Davison, Ph.D.

Lee Hall, Room 401
1301 College Avenue
Fredericksburg, VA 22401
Phone: 540-654-5656
E-mail: rdavison@umw.edu
Website: http://diversity.umw.edu/title-ix/

Confidential Resources

On-Campus

- Talley Center for Counseling Services: Lee Hall, Room 106, 540-654-1053
- Student Health Center: Lee Hall, Room 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

6. How do I demonstrate my learning?

Grading

	Points	**Total**
In-class Problem Sets (best 12 out of 14)	5	60
Digital Communication Assignment	30	30
Quizzes (best 8 of 10)	20	160
In-Class Exams (3)	100	300
Laboratory	250	250
Final Exam	200	200
Course Points		1000

Calculate your grade: *After adding up your accumulated points and dividing by the total possible 90% = A, 80% = B, 70% = C, 60% = D, and below 60% = F.*

A course grade of C- or better in CHEM 105 is required to enroll in CHEM 106

Mid-Semester Deficiency Reporting "U" criteria:

- Students with less than a C (less than 70% of possible points)
- Students who have 3 or more unscheduled absences
- Students who have not responded to instructor emails within 2 weeks

Description of Learning Activities:

Team Problem Sets 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 respectful of your teammates and ensure that everyone on the team understands and agrees to the work on the assignment that is submitted.

Laboratory: Students are expected to follow safety protocols, wear appropriate PPE, and arrive prepared with pre-laboratory assignments completed BEFORE labs start. During the labs, students should handle chemicals carefully, label clearly, clean up thoroughly, and respect equipment. If you don't know how to use a piece of equipment – ask! Report accidents immediately.

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.**

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.

Digital Communication Assignment: This assignment allows students to express their understanding of chemistry in a creative way while also making a positive impact in their community. It encourages the development of digital communication skills that are increasingly important in the modern world.

Quizzes: A total of ten quizzes will be given throughout the term. Quiz questions will be similar to problems on the team activities 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 three 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 written final on:

December 10th , 3:30-6:00 pm

According to University policy, any student who does not take the final exam will fail the course.

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.

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 during lecture. Additional reading materials will be posted to Canvas throughout the course.

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.

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.

Digital Knowledge Center

The Digital Knowledge Center (DKC), located in the Hurley Convergence Center room 408, empowers UMW students to be digital creators by providing the support, technology, and spaces to complete digital projects, including audio, video, graphic design, 3D modeling, and website projects. The DKC:

- helps students learn the tools of digital creation through one-on-one appointments.
- provides the technology for digital creation through media equipment loan at the HCC Info Desk, design software available in the DKC, and web-building platforms such as Domain of One's Own.
- operates spaces for digital creation, including the HCC Video Production Studio, DKC Podcast Studio, HCC Vocal Booth, and DKC 3D Print Lab.

UMW students can find out more and book appointments with the DKC at dkc.umw.edu.

Printable Course Schedule: The weekly modules in Canvas will adhere to this schedule as closely as possible. The quiz and exam dates are set. The instructor reserves the right to adjust, with notice, this schedule to better convey course content and meet student needs.

Fall 2024 Tentative Course Schedule				
Date		Topic	Read	Something Due
Aug	27	Introduction: Matter, Properties, and Changes	1.1, 1.2, 1.6	
	29	Matter, Properties, and Changes	1.1, 1.2, 1.6	Q1
Sept	3	Atomic Structure and Isotopes	1.2., 1.3, 1.6	
	5	Moles and Molar Mass	2.4, 4.3, 4.4	Q2
	10	Moles and Molar Mass	2.4, 4.3, 4.4	
	12	Moles and Molar Mass	2.4, 4.3, 4.4	Q3
	17	**Exam 1**	**1.1-1.3, 1.6, 2.4, 4.3-4.4**	**Exam 1**
	19	Chemical Reactions	2.11, 2.12, 5.12, 5.13	
	24	Chemical Reactions - Biochemistry	2.11, 2.12, 5.12, 5.13	Q4
Oct	1	Biochemistry - Significant Figures and Unit Conversions- Problem Solving Techniques	1.4, 11.1, 11.8 Appendices 1&2	
	3	Periodic Properties and Electronic Structure	3.1-3.3	Q5
	8	Nomenclature, Molecular Structure and IMF	3.8, 4.1, 5.1, 5.2	
	9	Nomenclature, Molecular Structure and IMF	3.8, 4.1, 5.1, 5.2	Q6
	15	*Fall Break – No Class*		
	17	**Exam 2**		**Exam 2**
	22	Solution Chemistry	5.5-5.9, 12.2	

			Appendix 3	
	24	Solution Chemistry	5.5-5.9, 12.2	Q7
	29	Electrical Chemistry	8.1, 8.2	
	31	Electrical Chemistry	8.1, 8.2	Q8
Nov	5	*Election Day – No Class*		
	7	Fuel Chemistry	6.1-6.4, 6.15-6.17	Q9
	12	Fuel Chemistry - Alternative Fuels	6.1-6.4, 6.15-6.17	
	14	**Exam 3**		**Exam 3**
	19	Nuclear Chemistry	7.1-7.5	
	21	Environmental Chemistry	2.16, 4.12, 7.10	Q10
	26	Environmental Chemistry	2.16, 4.12, 7.10	
	27-29	*Thanksgiving Break – No class*		
Dec	3	Scientific Communications		DCA
	5	Review		
	10	**Final Exam**	cumulative	3:30-6:00 p.m.

Laboratory Schedule:

Week of	**General Concepts**	**Lab**	**Assignments Due**
8/26	Matter, Properties, and Changes	Introduction, Lab Policies, and Safety	
9/2	Atomic Structure and Isotopes	Separation of Mixtures	Separation of Mixtures Pre-Lab
9/9	Molar Mass, Moles	What's in a Mole	Separation of Mixtures Report Mole Pre-Lab Assignment
9/16	Chemical Reactions	Chemical Reactions Lab	Mole Lab Report

			Chemical Reactions Pre-Lab Assignment
9/23	Biochemistry	Nutrition Lab	Chemical Reactions Report Nutrition Pre-Lab Assignment
9/30	Periodic Properties Electron Configurations	Spectroscopy	Nutrition Report Spectroscopy Pre-Lab Assignment
10/7	Nomenclature Molecular Structure and IMF	Principle 10: Design for Degradation Molecular Geometry Lab	Spectroscopy Report Molecular Geometry Pre-Lab Assignment
10/14		Fall Break Week – NO LAB	
10/21	Solution Chemistry	Solutions	Nutrition Report Solutions Pre-Lab Assignment
10/28	Electrical Chemistry	Batteries	Batteries Pre-Lab Notebook
11/4	Fuel Chemistry	Principle 6: Design for Energy Efficiency Fuel Types Lab	Solutions Report Fuel Types Pre-Lab Assignment
11/11		TBD	
11/18	Nuclear Chemistry	Half-lives	Nuclear Chemistry Pre-Lab Assignment
11/25		Thanksgiving Break – NO LAB	
12/2	Environmental Chemistry	Principle 12: Inherently Safer Chemistry for Accident Prevention	H_2 Gas Generation Report Safer Chemistry Presentations

Last day to drop: Friday, 10/13/2024

Last day to withdraw: Friday, 12/6/2024