Foundations of Chemistry: CHEM 101, Sections 1&2
Fall 2024

Instructor: Leanna Giancarlo
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Lecture: section 1: MWF 10:00 – 10:50 am, Jepson Science Center 219
section 2: MWF 11:00 – 11:50 am, Jepson Science Center 219

Office Hours: M 1:30 – 2:30 pm, W 12:30 – 1:30 pm; T 1 – 2 pm; F 1:30 – 2:30 or by appointment; there are another 2 office hours for 300-level students on M 12:30 – 1:30 pm and W 1:30 – 2:30 pm that you can attend; however, 300-level students will be assisted first.

Required Materials:

- Foundations of Chemistry (Giancarlo and Scott) – available on Canvas as a downloadable electronic file; you may print the text or use it as an eBook
- subscription to Aktiv Chemistry – online learning tool; available through the Bookstore or directly from the website (aktiv.com)
- Coursepack for CHEM 101 Fall 2024
- 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

Course Description:

Chemistry is a quantitative science and is grounded in a mathematical and experimentally derived description of nature. This course is designed to develop fundamental mathematics skills and introduce foundational chemistry concepts for students intending to major in a scientific field and who will subsequently enroll in General Chemistry. Use of mathematics will be stressed in the context of chemical problems involving measurement, atoms, molecules, reactions (stoichiometry) and aqueous solutions.

The course is centered around development of critical thinking and problem-solving skills, especially those required to successfully navigate the "word problems" that comprise a mathematical and experimental science like Chemistry. Problem-solving skills and strategies are emphasized in accord with the numerical literacy inherent in the discipline. To succeed in this course, these problem-solving skills must be practiced and developed. By attending lectures faithfully and completing the suggested practice problems and assignments, each student can begin to acquire the skills necessary to become a critical thinker.

Course-Specific Learning Objectives:

After completing this course, a student should be able to

- Understand how to extract information from a chemical “word problem”
- Develop fundamental number skills related to solving chemical problems
- Be able to use information to solve problems related to chemical principles involving measurement, atomic structure, reactions (stoichiometry) and aqueous solutions

Grading: Grades will be based on the following

	Points	**Total**
Hourly Examinations (3)	140	420
Team Activities (best 5)	20	100
In Class Assessments (best 5)	20	100
Aktiv Chemistry Assignments	10	130
Cumulative Final Exam	250	250
		1000

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

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. 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 **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.

Team Activities:

Occasional class periods, mostly Fridays, there will be a graded team activity to be completed by students in teams of 3 or 4. Teams will be chosen for each activity at the beginning of the class at random. The team activities are listed in the schedule given below. The activities must be submitted by the end of the class period and will be graded; these serve as 10% of your grade and because of the nature of the activities are very difficult to be made up due to a missed class.

In Class Assessments (quizzes):

Periodically, there will be a quiz given in class on the material that was presented. These in class quizzes will examine your knowledge of fundamental concepts and math skills and typically take 10 minutes. They are a lower stakes way to assess whether you are understanding the material prior to the exams.

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. Team Activities are listed in parentheses because those dates may change depending on where we are in lecture.

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 Aktiv) 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:

UNIT	Chapter	Topics
1	1	Active Learning, Study Skills Introduction to Chemistry
	2	Atomic Theory, Matter, Numbers
	3	Significant Figures Order of Operations Conversion Factors
2	4	Learning about Learning Periodic Table Atomic Structure Graphing
	5	Nomenclature

UNIT	Chapter	Topics
		Molar Masses
	6	Formulas
		Gases
		Pressure
3	7	Moles and Chemical Formulas
		Percent Composition
		Empirical and Molecular Formulas
		Combustion Analysis
	8	Moles and Chemical Equations
		Balancing Chemical Reactions
	9	Study Skills (Revisited)
		Stoichiometry (moles to moles)
		Limiting Reagents
	10	Chemical Reactions
		Electrolytes
		Net Equations

Course Schedule:

8/26 Introduction	8/28 Study Strategies and Chapter 1	8/30 Chapter 1
9/2 LABOR DAY – NO CLASS	9/4 Chapter 1 (Team Activity 1)	9/6 Chapter 2 Aktiv #1 due
9/9 Chapter 2	9/11 Chapter 2/3	9/13 Chapter 3 Aktiv #2 due
9/16 Chapter 3 (Team Activity 2, part 1)	9/18 Chapter 3 (Team Activity 2, part 2)	9/20 Chapter 3 Aktiv #3 due
9/23 **Exam One**	9/25 McGuire Lecture	9/27 Chapter 3 Aktiv #4
9/30 Chapter 3 (Team Activity 3)	10/2 Chapter 3	10/4 Chapter 4 Aktiv #5
10/7 Chapter 4	10/9 Chapter 4	10/11 Chapter 4/5 Aktiv #6
10/14 FALL BREAK – NO CLASS	10/16 Chapter 5	10/18 Chapter 5 Aktiv #7
10/21 Chapter 5	10/23 Chapter 5	10/25 Chapter 5 (Team Activity 4) Aktiv #8

10/28 **Exam Two**	10/30 Chapter 6	11/1 Chapter 6 (Team Activity 5) Aktiv #9
11/4 Chapter 6	11/6 Chapter 6	11/8 Chapter 6 Aktiv #10
11/11 Chapter 6	11/13 Chapter 7	11/15 Chapter 7 Aktiv #11
11/18 Chapter 7	11/20 Chapter 8	11/22 Chapter 8/9 Aktiv #12
11/25 Chapter 9	11/27 THANKSGIVING BREAK	11/29 THANKSGIVING BREAK
12/2 Chapter 9 (Team Activity 6)	12/4 **Exam Three**	12/6 Chapter 9/10 and Review; Aktiv #13

Final Exam: section 1: Friday, December 13, 2024; 8:30 – 11:00 am
section 2: Monday, December 9, 2024; 12:00 – 2:30 pm