

General Chemistry: Chemistry 112 Section 1

Fall 2019

Instructor:

Dr. Leanna C. Giancarlo
Office: 436 Jepson
Phone: 654-1407
email: lgiancar@umw.edu
website: <http://canvas.umw.edu>

Lecture: MWF 11:00 – 11:50 a.m.; Jepson 454

Office Hours:

MT 1:00 – 2:00 pm
F 2:00 – 3:00 pm or by appointment

Required Course Materials:

Text: Tro, *Principles of Chemistry: A Molecular Approach*, 3rd edition

Course Pack: CHEM 112 Section 1

Subscription to MasteringChemistry: On-line quizzes/homework site

Calculator: TI-30X series or Casio FX260 with scientific notation and logarithmic/exponential functions; you will need this type of calculator for ALL examinations or an equivalent approved by the instructor. You must have a calculator of this type to work practice problems and in-class problems. The mathematics for this course is a higher level than CHEM 111; you cannot succeed without practice using the same device that you will have for the exams. Cellular phones are not permitted on exam days.

Course Description, General Education and Course-Specific Learning Objectives:

This course in part satisfies the Natural Science General Education requirement. After completing the course sequence, a student should

- Be able to describe the scientific methods that lead to scientific knowledge
- Be able to report and display data collected, interpret experimental observations and construct explanatory scientific hypotheses
- Be able to use theories and models as unifying principles that help us understand the natural world
- Be able to identify how the natural sciences are used to address real-world problems

Chemistry is everywhere, whether you realize it or not; it can be exciting, useful, or even dangerous. General Chemistry is designed so that each student learns the fundamental concepts of chemistry. This course builds upon the knowledge gained in CHEM 111 regarding chemical reactions, forces, and bonding. To succeed, problem-solving skills must be practiced and developed. Chemists 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 essential in all professional areas, including business, law, medicine, etc.) 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

Grading:

4 Hourly Exams at 100 points each	40%
On-Line Chapter Quizzes	10%
Laboratory at 250 points	25%
Cumulative Final Exam at 250 points	25%

Grades will be determined on the following point scale

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

Students with an exam and quiz average of C or less will receive a midsemester report.

A grade of C- or better in CHEM 111 is required for you to enroll in CHEM 112; a grade of C or better in CHEM 112 is required for any Chemistry course for which CHEM 112 is listed as a prerequisite.

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.

Honor System: All graded work (hourly exams, all quizzes, extra credit assignments, laboratory reports, final exams) must be your own and pledged as such:

I hereby declare upon my word of honor that I have neither given nor received any unauthorized help on this work.

Signed

No late assignments will be accepted. It is recommended that the suggested problems be done individually and then as a group when questions arise. You should discuss difficulties with the suggested problems or lecture/laboratory material with me.

Class Attendance: Class attendance is highly recommended. The material discussed in lecture frequently has a different emphasis than that provided by the textbook. Also, time has been set aside in the course schedule to discuss example problems. Students are responsible for all covered materials during a missed class. Missed laboratories and exams cannot be made up. Exams will be rescheduled 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. (Would you come late to a job interview or a job?) 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.

PASS: 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 14 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.

Students with Disabilities: The Office of Disability Resources has been designated by the University as the primary office to guide, counsel, and assist students with disabilities. Students needing accommodations for this class should contact this office as soon as possible; afterwards, you should make an appointment with me to discuss your approved accommodations. Please bring your accommodation letter with you to the appointment. I will hold any information you share with me in the strictest confidence unless you give me permission to do otherwise.

Title IX: 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 <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.

Class Recordings: Video and/or audio recording of class lectures and review sessions without the advance consent of the instructor is prohibited. On request, the instructor may grant permission for students to record course lectures, on the condition that these recordings are only used as a study aid by the individual making the recording. Unless explicit permission is obtained from the instructor, recordings of lectures and review sessions may not be modified and must not be transferred or transmitted to any other person, whether or not that individual is enrolled in the course. Students with approved accommodations from the Office of Disability Resources permitting the recording class meetings must present the accommodation letter to the instructor in advance of any recording being done. On any days when classes will be recorded, the instructor will notify all students in advance. Distribution or sale of class recordings is prohibited without the written permission of the instructor and other students who are recorded. Distribution without permission is a violation of educational law. This policy is consistent with UMW's Policy on Recording Class and Distribution of Course Materials.

Other “helpful” information:

The tentative schedule that follows is how I see the course arranged. It is not set in stone. 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.

Success in a chemistry course requires some work on your part. Successful students typically spend approximately 1 hour per day on chemistry. They devote this time to reviewing notes, attempting the suggested problems and reading ahead for the next lecture. Some "secrets" behind their success include (but are not limited to)

- reading the material prior to class and completing the preview quizzes.
- attending the lectures.
- taking good notes.
- asking questions.
- solving the suggested problems for each chapter. (Attempting extra problems is also a great idea. As in all aspects of life, “practice makes permanent.” If you are confused, seek help. Practicing a misconception just solidifies it; it won't correct it.)
- attending PASS sessions regularly.
- consulting your peers when you are struggling with the solution to a 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 a requisite background knowledge.)
- enlisting the aid of the instructor (office hours or appointments, before or after class).
- reviewing the appropriate sections of the text and all notes after class.
- coming prepared to review sessions with questions in hand.
- using the on-line aids provided with your book.

Course Outline:

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Topic	Chapters
Chemical Kinetics	Chapter 13 and Appendix I A, B, D
Chemical Equilibrium	Chapter 14 and Appendix I C
Acid/Base	Chapter 15
Advanced Acid/ Base	Chapter 16.2 – 16.4
Solutions	Chapter 12
Chemical Equilibrium	Chapter 16.5 – 16.7
Solubility	
Free Energy and Thermodynamics	Chapter 17
Electrochemistry	Chapter 18
Nuclear Chemistry	Chapter 19.2 – 19.7

Final Exam: Wednesday, December 11, 2019; 12:00 – 2:30 pm

General Chemistry: Chemistry 112 Laboratory

Fall 2019

Section 1: W 1:00 p.m. – 3:50 p.m.; 210 Jepson

Required Laboratory Materials:

Laboratory Package: part of the CHEM 112 coursepack

Laboratory Notebook: carbonless, duplicate laboratory notebook

Safety Goggles: available in the Bookstore

Laboratory Coat: available in the Bookstore

Scientific Calculator: see above

Course Description: The laboratory portion of this course is designed so that each student gains experience in the practical, hands-on aspects of chemistry. The laboratory has been developed in a manner that combines skill development with open-ended problem solving and critical thinking. The National Science Foundation and chemical industry leaders have identified an “employable quintet” of skills that the laboratory program strives to meet. The key points of this quintet are

- 1) in-depth technical knowledge
- 2) problem solving ability in a laboratory setting
- 3) flexibility in learning and working
- 4) the ability to work in teams
- 5) clarity in oral and written communication.

Laboratory work will emphasize problem solving, “thinking outside of the box” and teamwork. Specific chemical techniques will be developed; additionally, the laboratory will focus on team projects through development of an experimental procedure and the collection and interpretation of data.

Grading:

Weekly skill and technique experiments at 100 points each

Projects at 200 points each

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

Honor System: Work in the laboratory will occasionally (as announced in class) require a partner or team effort for data collection and for the open-ended projects, but all calculations, data analysis, and writing must be completed independently. 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; any unattributed ideas are plagiarism. All graded work (i.e., all laboratory assignments) must be your own. Late assignments **will not be accepted and will result in a grade of zero**. Please, discuss difficulties with the laboratory material with me.

Class Attendance: Class attendance is mandatory. Due to the hands-on, experiential nature of the laboratory, failure to attend and/or complete laboratories will result in failure in the course; more specifically, **if a student misses three (3) lab periods or more, (s)he will fail the entire course**. Essential safety and procedural information is presented at the beginning of laboratory; therefore, lateness cannot be accepted or tolerated. Repeated lateness will result in point deductions for each lab. If excessive safety information has been missed due to lateness, the student will not be permitted to conduct the experiment; this **will** count as a missed laboratory period. Missed laboratories cannot be made up; in the event of a legitimate emergency contact the instructor immediately or prior to the scheduled day and time of the lab meeting (for an activity related conflict).

The proposed schedule for the lecture and laboratory is listed on the chart below.

8/26 Chapter 13	8/28 Chapter 13	8/30 Chapter 13
9/2 Labor Day NO CLASS	9/4 Chapter 13	9/6 Chapter 13
9/9 Chapter 13	9/11 Chapter 14	9/13 Chapter 14 Quiz #1
9/16 Chapter 14	9/18 Chapter 14 Quiz #2	9/20 EXAM 1
9/23 Chapter 15	9/25 Chapter 15	9/27 Chapter 15
9/30 Chapter 15	10/2 Chapter 15	10/4 Chapter 16 (pt1) Quiz #3
10/7 Chapter 16 (pt1)	10/9 Chapter 16 (pt1)	10/11 Chapter 16 (pt1)
10/14 FALL BREAK	10/16 Chapter 12 Quiz #4	10/18 EXAM 2
10/21 Chapter 12	10/23 Chapter 12	10/25 Chapter 16 (pt2) Quiz #5
10/28 Chapter 16 (pt2)	10/30 Chapter 16 (pt2)	11/1 Chapter 16 (pt2)
11/4 Chapter 17 Quiz #6	11/6 Chapter 17	11/8 Chapter 17
11/11 Chapter 18	11/13 Chapter 18 Quiz #7	11/15 EXAM 3
11/18 Chapter 18	11/20 Chapter 18	11/22 Chapter 18
11/25 Chapter 19 Quiz #8	11/27 THANKSGIVING BREAK	11/29 THANKSGIVING BREAK
12/2 Chapter 19	12/4 EXAM 4	12/6 Review Quiz #9

8/28 Check-in; safety; vol measurements
9/4 Kinetics
9/11 Qualitative Equilibrium
9/18 Titrations
9/25 K determination
10/2 Project 1
10/9 TBD
10/16 Titration Day
10/23 Colligative Properties
10/30 Solubility
11/6 Project 2
11/13 TBD
11/20 Redox
11/27 BREAK
12/4 Lab final; check out

Final Exam: Wednesday, December 11, 2019; 12:00 – 2:30 pm