

General Chemistry Chem112 (Section 2)

University of Mary Washington
Spring 2020

Lecture TR, 9:30 – 10:45 (Jepson 451)

Laboratory T, 2:00 – 4:45 (Jepson 214)

Professor Charles Sharpless (Jepson 441, Phone x1405, csharp@umw.edu)

Office Hours Walk-in: MR (1-3), T (11-12) Appointments also welcome!

Course Websites Lecture notes, prelab powerpoints, and grades (<https://canvas.umw.edu/login>)
ALEKS (<https://www.aleks.com/login>)

Required Course Materials (available at the bookstore)

Textbook: *Principles of Chemistry: A Molecular Approach*, 3rd ed. (N. Tro)

ALEKS Subscription: Available at the bookstore

Lab Coursepack: For section 2

Lab Notebook: With carbonless duplicate pages

Safety Equipment: Laboratory goggles and lab coat (at bookstore)

Calculator: Non-programmable, with scientific notation and exponential functions. The TI 30 series calculators at the bookstore are perfect.

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
- report and display data collected, interpret experimental observations and construct explanatory scientific hypotheses
- use theories and models as unifying principles that help us understand the natural world
- identify current issues in which scientific progress may challenge traditional social ideas or present moral or ethical dilemmas

This course is a continuation of Chem111 in which several quantitative aspects of chemical reactions will occupy our attention, including kinetics, equilibrium, acid/base chemistry, buffers, titrations, redox reactions, and electrochemistry. We will also extend the study of thermochemistry and examine how energy changes in chemical reactions are quantitatively related to reaction rates and the position of equilibrium. By the end of the course, you should be able to solve moderately complex chemical problems encountered in a variety of physical sciences (e.g., biology, environmental science, materials science). The laboratory portion of this course is designed to give you hands-on, practical experience in chemistry and develop your ability to design and conduct scientific experiments.

Grading

40%	Four 50 min. in-class exams
25%	Laboratory
20%	Final exam
7.5%	ALEKS objective completion
7.5%	ALEKS pie completion

* *Students with an average of C or below on 3/13 will receive a mid-semester deficiency report.*

* *No late assignments will be accepted without my prior consent.*

* *Missed laboratories and exams may not be made-up. If you know in advance that you will miss a lab or an exam I insist that you contact me ahead of time to make arrangements. In the event of emergency, contact me as soon as possible to inform me of your situation.*

Exams There will be four closed book exams throughout the semester. Each one is worth 10% of your grade. The dates are announced on the syllabus schedule (last page). For exams, the chemistry department will provide non-programmable calculators, which must be used. The only thing you will need to bring is a writing implement.

Laboratory Consult your laboratory course pack (required, and available at the bookstore).

Final Exam The final exam is the American Chemical Society National Standardized Exam. It is cumulative and will be given on the date noted in the schedule. It is worth 20% of your grade. In accordance with University policy, any student who does not take the final exam will fail the course.

Practice Homework Problems End-of-chapter problems from the textbook have been assigned and posted on Canvas. To succeed in chemistry, it is essential that you do these problems. These are not graded per se, but completed problem sets are worth 3 extra points on the corresponding exam grade. To receive these points, the problem sets must be turned in on the due dates specified on Canvas. Answers to these questions are in the back of the book and detailed solutions for some can be found in the solutions manual. There is no better way to improve your chemistry problem-solving ability than to practice. Working in groups can be helpful, but you must ensure that you can do the problems yourself. If you have difficulty with these, please come to my office hours or PASS sessions.

Class Attendance Attendance at lecture is highly recommended and is mandatory for lab. The material covered in lecture will frequently differ in emphasis from the textbook. Also, lecture time will be used to discuss example problems and address any questions or problems you have with them. Should you miss a class, you are nonetheless responsible for the material covered.

Classroom Etiquette If you arrive late to class, please enter quietly and seat yourself with minimal disturbance to your fellow students. Please refrain from eating in the classroom. Please turn off cell phones in class. Cell phones are prohibited from examinations. Please do not distract yourself and others by reading newspapers or browsing the web during class time, either on a laptop or a PDA.

Honor System In accordance with the University's Honor Code, all work submitted for grading must be your own and be pledged as such by writing at the end of the work, "I hereby declare upon my word of honor that I have neither given nor received any unauthorized help on this work. (your signature)". More details can be found at <https://cas.umw.edu/chemistry/university-policy-statements-for-selected-courses/>

Disability Resources Students who require or feel they may require accommodations due to a disability should visit the Office of Disability Resources online (<http://academics.umw.edu/disability/>). More details are at <https://cas.umw.edu/chemistry/university-policy-statements-for-selected-courses/>

Title IX Statement UMW is 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. You may talk to me, but as a "Responsible Employee" of the University, I must report to UMW's Title IX Coordinator what you share. More details can be found at <https://cas.umw.edu/chemistry/university-policy-statements-for-selected-courses/>

Classroom Recordings Classroom activities may be recorded by students enrolled in the course for the personal, educational use of that student or other students presently enrolled in the class. More details are at <https://cas.umw.edu/chemistry/university-policy-statements-for-selected-courses/>

How to Succeed in Chem112

- Spend about an hour a day on chemistry (reading, reviewing notes, doing ALEKS and homework)
- Attend lecture regularly
- Take careful notes, including what your professors says, not just what is written on the board
- Attend PASS (see below)
- Use your textbook wisely
 - Start by quickly skimming each chapter. Look at what seems familiar and unfamiliar, and use it to plan your reading
 - Go over each “Sample Problems” in the chapters carefully and then try the “Follow-Up Problems” that follow immediately after the samples
 - Note that there is a glossary of terms in the back of the book that you may find useful.
- Do the reading assignment before coming to class
- Organize your class notes as soon as possible after coming to class
- Review the reading assignment after coming to class
- Do the practice problems alone and in groups
- When doing ALEKS, record all your work in a dedicated notebook for study and review
- Come to exam review sessions prepared with questions (thought-out beforehand)
- Seek the instructor’s help when needed (office hours, before/after class, email)
- In the event that you require additional help beyond the instructor and PASS, seek peer-tutoring through Academic Services (<http://academics.umw.edu/academicservices/>)

ALEKS (Assessment and LEarning in Knowledge Spaces) This is an online, mastery-based assessment and learning system that uses artificial intelligence to determine what you know, don’t know, and are most ready to learn. This begins with an Initial Knowledge Check, which is a 25-30 question adaptive assessment that determines which course topics you have already mastered and which you have not. This knowledge is depicted in a pie chart divided into different areas of the course which will be filled in as you master topics. Each week, you will be responsible for completing an objective that contains topics already covered in lecture. Performance on these objectives will determine your score on Objective Completion (7.5% of your course grade). Generally, you must complete 80% of the Objective to earn credit. By the end of the semester, the goal is to complete the entire pie chart with topics you have mastered; performance on this determines your Pie Completion score (also 7.5% of your grade).

Peer-Assisted Study Sessions Peer-Assisted Study Sessions (PASS) are available for this course to assist you in better understanding of the course material. The PASS program provides peer-facilitated study sessions led by qualified and trained undergraduate leaders who attend the lectures with students and encourage students to practice and discuss course concepts in sessions. Sessions are open to all students and will focus on the most recent material covered in class. These sessions are not tutoring but rather sessions to compare class notes, review and discuss important concepts, develop appropriate strategies for studying, and prepare for exams. Attendance is free and voluntary, *you may earn up to three extra credit points towards your final course grade* by attending at least one PASS session per week for at least ten weeks. You must be present for an entire PASS session to get credit for that session; students who are disruptive will not earn extra credit points. Attendance will be recorded in order to keep track of extra credit points. You are free (and encouraged!) to attend as many sessions as you like, but credit will only be given as noted above.

Spring 2020 Weekly Schedule (subject to change)

Week Of	Assigned Readings and Exam Dates	ALEKS Objective	Lab
Jan 13 th	Chapter 13 (Kinetics)	1 - Jan 17	Check in & Volumetric Meas.
Jan 20 th	Chapter 13 (Kinetics) Chapter 14 (Equilibrium)	2 - Jan 20	Kinetics
Jan 27 th	Chapter 14 (Equilibrium) <i>Friday, 1/31: drop period ends</i>	3 - Jan 27	Equilibrium
Feb 3 rd	Chapter 15 (Acids and Bases) <i>EXAM 1, Feb. 6th (Chapters 13 & 14)</i>	4 - Feb 5	Titrations
Feb 10 th	Chapter 15 (Acids and Bases) Chapter 16.1-16.4 (Buffers, Titrations)	5 - Feb 10	K _a Determination
Feb 17 th	Chapter 16.1-16.4 (Buffers, Titrations)	6 - Feb 14	Project 1
Feb 24 th	Chapter 12 (Solutions and their properties) <i>EXAM 2, Feb. 27th (Chapters 15 & 16.1-16.4)</i>	7 - Feb 26	TBD
Mar 2 nd	SPRING BREAK		
Mar 9 th	Chapter 12 (Solutions and their properties) Chapter 16.5-16.7 (Solubility, Complex Ions) <i>Advising for fall 2019 begins (see your advisor!): 3/9 to 3/20</i>	8 - Mar 9	Colligative Properties
Mar 16 th	Chapter 16.5-16.7 (Solubility, Complex Ions) <i>Friday, 3/20: last day to declare P/F or withdraw from courses</i>	9 - Mar 16	KHTar Solubility
Mar 23 rd	<i>EXAM 3, Mar. 24th (Chapters 12 & 16.5-16.7)</i> Chapter 17 (Thermodynamics)	10 - Mar 23	Titration Curves
Mar 30 th	Chapter 17 (Thermodynamics) Chapter 18 (Electrochemistry)	11 - Mar 30 12 - Apr 3	Project 2
Apr 6 th	Chapter 18 (Electrochemistry)	13 - Apr 10	TBD
Apr 13 th	Chapter 18 (Electrochemistry) <i>EXAM 4, Apr. 16th (Chapters 17 & 18)</i>	14 - Apr 15	Redox
Apr 20 th	Chapter 19 (Nuclear Chemistry)	15 - Apr 24	Check-Out LAB FINAL
Apr 27 th	<i>Final Exam, Tues, Apr 28th 8:30 – 11:00 AM (JEPS 451)</i>	ALEKS Pie: Apr 29 th 11:59 pm	