CHEM 110.
Fundamentals of Chemistry
Spring 2025

INSTRUCTOR

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OFFICE HOURS

MWF: 10:00 – 11:00 am; Monday & Tuesday: 12:00 pm – 1:00 pm

LECTURES

MWF: 9:00 – 9:50 am; McComsey Hall 204

COURSE TEXTBOOK

Chemistry, 2nd edition by Flowers, Theopold, Langley, and Robinson; OpenStax, 2019. ISBN: 978-1-947172-61-6 (https://openstax.org/details/books/chemistry-2e)

SUPPLEMENTAL MATERIAL

Photocopied handouts may be provided when appropriate. Calculator with root function, logs, and antilogs will be required for exams and quizzes.

COURSE CONTENT:

Chemistry has been called the most "central" science since topics discussed in chemistry find relevance in biology, physics, medicine, law, economics, ecology, materials science, environmental studies, and geology. Chemistry is the study of matter, and matter is anything that takes up space and has non-zero rest mass. Therefore, chemical understanding is central to scientific wisdom.

CHEM 110 is an intensive review of the fundamentals of chemistry, with particular emphasis placed on solving chemistry problems. Topics include measurements, formulas and nomenclature, equations, stoichiometry, atomic and molecular structure, solution concentrations, acids and bases. This course is designed to prepare students majoring in the sciences for their general chemistry sequence, CHEM 111 and CHEM 112.

COURSE OBJECTIVES

By the end of the semester, you should be able to:

a) Read, write, and talk about chemistry using standard scientific vocabulary.
b) Demonstrate an understanding of the rules for determining significant digits and working with exponential notation.
c) Use a calculator to perform simple mathematical operations involving significant digits and exponential notation.

d) Interconvert units in the English and international systems of measurements using the conversion factor method.
e) Solve simple density problems involving solids, liquids, and gases.
f) Classify common substances as elements, compounds, or mixtures.
g) Identify the three subatomic particles and explain the relative mass of each.
h) Show the correct notation for writing the symbol of an element.
i) Deduce the atomic number, atomic mass, number of protons, neutrons and electrons given the symbol of an element.
j) Determine the atomic mass of an element given the composition of its isotopes.
k) Name simple ionic or covalent compounds given the formula, and write down the formula of a compound given its name.
l) Determine the number of moles using mass and molar mass.
m) Determine the number of moles in standard solutions.
n) Determine the amount of products or reactants from equation using the rules of stoichiometry.
o) Understand the essential difference between ionic and covalent bonding.
p) Understand the essential concepts of thermochemistry
q) Gain a familiarity with properties of gases and gas laws.

GRADING

Grading will be as follows: A 1000-point scale will be used to determine the final grade. There will be five examinations, each worth 10% of your overall course grade. In-class components are short assignments distributed and collected during the lecture. They will not be announced in advance***. You must be present to receive credit.*** Additionally, there will be on-line assessments in the D2L environment which will be worth 30% of the overall grade.

The maximum possible numbers of points are as follows:

Exam 1	100
Exam 2	100
Exam 3	100
Exam 4	100
Exam 5 (final)	100
In-class components	200
On-line quizzes	300
Total	**1000 points**

900 guarantees at least an A-
800 guarantees at least a B-
700 guarantees at least a C-
600 guarantees at least a D-

EXAMINATIONS

All examinations will count toward the course grade and it is expected that students will take all of the examinations at their regularly scheduled times. If you miss an exam without a valid excuse you will receive a score of zero. With a valid excuse, you may be allowed a special make-up exam in some circumstances, but I cannot guarantee that it will be equally difficult as the regular exam.

PRACTICE PROBLEMS

Approximately five problem sets will be suggested. Their completion is optional, and they will not be graded or returned if submitted, but you are advised to attempt at least one of each type of problem suggested as preparation for the course examinations. Suggested practice problems will be posted on the Desire2Learn on-line course soon after the semester begins and will remain posted until the end of the course.

ON-LINE COMPONENTS

Approximately eight assessments will be administered using the Desire2Learn software. Be sure to log on at https://millersville.desire2learn.com/d2l/login very soon after the first class meeting. Be sure to follow all instructions for submitting assessments. Pay close attention to the due dates.

ATTENDANCE

General chemistry concepts require a mathematical framework for their presentation. Concepts are cumulative in the sense that the student must master introductory concepts and derivations in order to fully understand more advanced topics in general chemistry. We will continue to build upon material mastered earlier, hence poor attendance will affect your class grade.

IN-CLASS COMPONENTS

From time to time I will ask the class to do an exercise which will be counted in the 200-point "In-class" component of the grade. The exercise will typically be short and may involve group work. If you do not attend class on the days that I collect in-class assignments, you will receive a grade of zero for that assignment.

DISABILITY STATEMENT

It is the responsibility of students who have professionally diagnosed disabilities to notify the instructor so that appropriate modifications can be made to meet any special learning needs. Specific questions should be directed to the Office of Learning Services, at 717-872-3178.

ACADEMIC DISHONESTY

Academic dishonesty includes unfairly advancing one's own academic performance or the performance of another, as well as intentionally limiting the academic performance of another student. Penalties for academic dishonesty will depend on the situation, ranging from a zero grade for the exam or assignment, to course failure. Your university's accreditation is based, in part, on academic standards of excellence. Academic dishonesty will devalue your degree.

CLASSROOM ETIQUETTE

Arrive on time. If you must be late, please enter quietly to cause minimal disruption. Cell phones must be silenced. No texting during class. If you must eat, please be considerate. Eat quietly and dispose of any trash. The instructor reserves the right to require students who are disruptive to leave the classroom.

TUTORING

Tutoring Chemistry tutoring is primarily available via drop-in Peer Learning Hours. You can just show up to these sessions to work on and get help with chemistry. Peer Learning Hours are listed on the department website at https://www.millersville.edu/chemistry/tutoring.ph

Fall 2023 ***Tentative Examination Schedule (subject to change):***

Day	Date	Topic
Friday	February 7	Chapter 1
Friday	February 28	Chapter 2
Friday	March 28	Chapter 3
Friday	April 18	Chapter 4
Wednesday	May 7*	Chapter 5 & 9

*Note that the final exam time is 8:00 – 10:00 am

Tentative Course Schedule (subject to change):

Week	*Topic*	*Reading*
Jan. 21	Classifying Matter and Measurement	1.1 – 1.3
Jan. 27	Measurement Uncertainty & Unit Conversion	1.4 – 1.5
Feb. 3	Mathematical treatment of results	1.6 & App. B
Feb. 10	Atoms, Ions, and Molecules	2.1 – 2.4
Feb. 17	Formula and symbolism	2.5 – 2.6
Feb. 24	Nomenclature	2.7
Mar. 3	Formula Mass and Empirical Formula	3.1 – 3.2
Mar. 10	Spring break – no classes	
Mar. 17	Molarity	3.3
Mar. 24	Other units for concentration	3.4
Mar. 31	Chemical Reactions	4.1 – 4.2
Apr. 7	Stoichiometry	4.3 – 4.4
Apr. 14	Chemical Yield & Quantitative Analysis	4.5
Apr. 21	Energy and Calorimetry	5.1 – 5.2
Apr. 28	Introduction to gases	9.1
May 5	Gas laws & Stoichiometry	9.2 – 9.3

Title IX statement

Millersville University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office for Civil Rights, Title IX requires University faculty members to report incidents of sexual discrimination, including sexual violence, shared by students to the University's Title IX Coordinator. Accordingly, if a student shares information about any incidents of sexual discrimination or sexual violence during a classroom discussion, in a writing assignment for a class, or in other contexts, faculty must report that information to the Title IX Coordinator. This information will only be shared with the Title IX Coordinator, who is the individual on campus designated to respond to reports of discrimination or sexual violence. While the Title IX Coordinator is not a confidential source of support, they will address matters reported to them with sensitivity and will keep your information as private as possible.

Additionally, faculty members are obligated to report sexual violence or any other abuse of a student who was or is a child (a person under 18 years of age) when the abuse allegedly occurred, to the person designated in the University's Protection of Minors policy. Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at: www.millersville.edu/titleix