
General, Organic and Biochemistry I (CHEM103)

Fall 2023

Dr. Aimee L. Miller

717-871-7414

Lecture: Brossman 102

Mon & Wed: 10:00 - 10:50

Labs: Caputo 328

Fri: 9:00 - 11:50

Fri: 12:00 - 1:50

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Office Hours: Caputo 325

Mon: 11:00 - 1:00

Wed: 11:00 - 12:00

Thur: 10:00 - 12:00

Alternate times by appointment (IP or Remote)

Course Description

Chem103 is the first semester course of General, Organic, and Biochemistry (followed by Chem104) for non-science majors. It serves as a G2 General Education course and satisfies the Lab requirement. Students in Chem103 will be introduced to basic theories relevant for general and organic chemistry, including nomenclature, reactions, and problem solving. (2 hrs lecture/2 hrs lab)

Necessary Background

Chemistry: High school chemistry is required

Math: Proficiency in algebra is essential

Course Objectives

The main goal is a solid understanding of the basics of chemistry. Students actively engaged in this course should be able to:

- Describe basic atomic components, use the periodic table and identify elements and chemical compounds by name and/or formula.
- Take accurate and precise measurements and do calculations using appropriate units and significant figures.
- Differentiate states of matter and their molecular interactions.
- Describe the role of valence electrons in chemical bonding and draw appropriate electron configurations for atoms and Lewis structures for compounds.
- Write balanced equations to describe chemical changes and do related calculations using mole and mass relationships.
- Describe acid-base and oxidation-reduction reactions, activation energy, and equilibrium.
- Work safely in a chemical laboratory using common laboratory equipment and materials.
- Accurately record and effectively evaluate lab experimentation and data.

Required Materials and Supplies

- ☐ D2L Course Access (Millersville University)
 - ☐ Aktiv Chemistry subscription including access during class times
 - ☐ Choice of access to related chemistry content via Open Source pdf texts (free in D2L) or any textbook titled something like *General, Organic, and Biochemistry*
 - ☐ Calculator: Scientific calculator capable of performing logarithmic (log, ln) and exponential (10^x , e^x , y^x) functions (cell phones may NOT be used for exams)
 - ☐ Laboratory Notebook: permanently-bound composition book
 - ☐ Laboratory Instructions: (distributed or available via D2L)
 - ☐ Safety Eyewear
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Course Policies

Millersville University: This class adheres to policies as outlined by MU ([links to full text in D2L](#)).

Class Participation: Students are responsible for material presented in class or distributed via D2L. Only graded work missed for an absence excused based on Millersville's approved guidelines may be made up. Please contact me in advance or as soon as possible to reschedule. Any graded work conducted outside the scheduled time may differ significantly in form and exact content from the in-class version.

Academic Honesty: Students are expected to conduct all course work in an honest and ethical manner, consistent with Millersville's policy. Cheating on coursework bypasses the learning process and will NOT be tolerated. Anyone caught cheating will be assigned a score of zero.

Cooperative Environment: Students are expected to be actively engaged in the classroom, so questions and discussion are encouraged. Repeated disruptive behavior (like tardiness, chatting, or cell phone noise/use) may be cause for dismissal from class and may affect final grade assignments. Students with special concerns are encouraged to speak with me and/or take advantage of campus resources, including the Office of Learning Services, the Tutoring Center, or the Counseling Center.

Homework & Activities: Practicing exercises related to the material we discuss in class is essential for mastering concepts and developing critical skills. This will be directed through **required online homework** in Aktiv. Exercises may be reworked multiple times if necessary to learn the concept and earn full credit. **Graded in-class activities** will also be used to encourage interaction with concepts. Students are urged to work independently on a broader range of examples, problems, and exercises in Aktiv, a textbook, or other online sites as we cover material.

Elemental Chemistry Presentations: Each individual student will research a chemical element and give a 5-minute oral presentation during the lab sessions on **Sep 27/28**. Basic information, general properties, and life applications for the element will be assembled into a PowerPoint file. Files must be submitted to D2L **at least 2 hrs BEFORE** the lab period that day. Deductions will be made: **1 pt** for late submissions online, **2 pts** for files only brought to class in person, and **5 pts** for an unexcused absence requiring presentation on another date. Detailed instructions, a template, and resources are available in D2L.

Recommendations for Success

- As we cover a topic in class, work practice exercises in the book and the related online problems. Starting early gives you time to review, learn, and earn full credit.
 - Read textbook sections matching class discussions to find additional explanations and example problems.
 - Ask questions in class, by e-mail, or in person. Remember, if you don't understand something, others probably don't either.
 - Plan to spend time at the Chemistry Peer Learning sessions where you can work with others or get help from a chemistry tutor.
 - Find a group of other students to study with so you can help each other.
 - Take advantage of Dr. Miller's office hours, review sessions, or connect electronically.
 - Use extra help available in D2L that might help you understand difficult material.
 - Review specific Course Objectives available in D2L to check that you are comfortable with all the concepts for each test.
 - Review returned exams and correct any mistakes to make sure you learn all the concepts for future use. Early skills are used extensively for later work.
 - Print out and read lab instructions in time to complete the online pre-lab questions before coming to lab.
 - Record lab notes and data directly into your notebook, label all information clearly, and complete all post-lab questions and a summary.
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Lecture Schedule (tentative)**Topic Order:**

It's All Chemicals: Elements, compounds, and structures of atoms and molecules

Exam 1: Monday, Sep 11

Tracking Chemicals: Ways we classify, measure, and calculate

Exam 2: Monday, Oct 2

Holding It Together: How bonds form and interactions drive behavior

Exam 3: Wednesday, Oct 25

Chemical Samples: Forms of matter we encounter and use everyday

Exam 4: Monday, Nov 13

Our Reactive World: Changes that make things work and how we follow them

Exam 5: Wednesday, Nov 29

Final Exam: Thur, Dec 7; 8:00 - 10:00
(comprehensive content)

Grading

Homework & Classroom Activities	15 %
Element Presentation	5 %
Unit Exams	43 %
Final Exam	15 %
<u>Lab Work</u>	<u>22 %</u>
Total	100%

NOTE: You must earn at least 60% in the lecture portion to pass Chem103. Your final grade will be assigned based on the combined lecture and lab scores.

Letter Grade Correlation

<i>Grade</i>	<i>Total %</i>	A	93.0-100	A-	90.0-92.9
B+	87.0-89.9	B	83.0-86.9	B-	80.0-82.9
C+	77.0-79.9	C	73.0-76.9	C-	70.0-72.9
D+	67.0-69.9	D	63.0-66.9	D-	60.0-62.9
F	<60.0				

Laboratory Policies

The laboratory component of Chem103 is designed to give you hands-on experiences that enhance learning by application. ***Students MUST prepare for, carry out, and report on ALL lab experiments or activities in Chem103.***

Attendance: Students should attend and complete every lab as scheduled. If an excused absence conflicts with your scheduled lab time, please contact the instructor as soon as possible to make alternate arrangements. Except for unavoidable, approved excuses, a missed lab may earn **NO credit** even though the work and report must still be made up. *Students with repeated lab attendance issues may not be able to make up the work needed to pass Chem103.*

Safe & Cooperative Environment: Students are expected to follow all directions regarding safety precautions and lab attire. More complete lab safety rules are posted in D2L and should be taped into your lab notebook for quick reference. Please notify the instructor about any special concerns (allergies, pregnancy etc.) that might require alternate arrangements for you to work safely in lab. You must also keep your lab drawer and general lab areas clean and tidy. Failure to follow instructions or clean up may result in a penalty for the week.

Instructions & Pre-Labs: Students are expected to come to lab each week with an understanding of the planned experiment/work. You should review the lab protocol/instructions posted on D2L and complete the **pre-lab quiz** in D2L by at **10 pm Thursdays**. (There is no pre-lab quiz with worksheet labs.)

Notebooks & Reports: Students must record **ALL** lab work directly into their notebook during lab. Calculations or analysis, a brief summary report, and answers to lab questions should also be written directly into the notebook. Failure to properly record data during lab may result in a **1 pt** penalty. Notebooks are due before leaving the lab unless arrangements are made with the instructor.

Laboratory Schedule (tentative)

Aug 25	Check In, Lab Safety & Chemical Hazards
Sep 1	Separation of a Mixture
Sep 8	Elements & The Periodic Table (lab & worksheet)
Sep 15	Measurements & Density
Sep 22	Names & Formulas of Compounds (worksheet)
Sep 29	Element Presentations
Oct 6	Molecular Models & Naming Review (worksheet)
Oct 13	Gas Law Relationships
Oct 20	Formula of a Compound
Oct 27	Stoichiometry Calculations (worksheet)
Nov 3	Making a Battery & pH Testing
Nov 10	Chemical Equilibrium
Nov 17	Solutions, Dilutions & Titration, Check Out
Nov 24	<i>Thanksgiving break (no lab)</i>
Dec 1	Lab Make Up (only as needed)

Lab Grading

Lab Notebook Set-up (<i>week 1</i>)	5 pts
Weekly Lab	15 pts each
<i>(generally, a 3-pt pre-lab quiz & 12-pt notebook report)</i>	
