CHEM 111.02 .
Introductory Chemistry I
Spring 2026

INSTRUCTOR

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OFFICE HOURS

MWF: 10:00– 11:00 am; CAPUTO 320
Monday & Thursday: 12:00 – 1:00 pm; CAPUTO 320

LECTURES

MWF: 11:00 – 11:50 am; RODDY 149

RECITATION & LABORATORY

A: Wednesday 2:00 – 2:50 pm RODDY 153; 3:00 – 4:50 pm CAPUTO 328
B: Thursday 9:00 – 9:50 am RODDY 153; 10:00 – 11:50 am CAPUTO 328
C: Thursday 1:40 – 2:30 pm RODDY 153; 2:40 – 4:30 pm CAPUTO 328

COURSE TEXTBOOK

Chemistry, 10th edition, by Steven S. Zumdahl, Susan A. Zumdahl, and Donald J. LaCoste; Brooks/Cole publishers, 2016; ISBN-13: 978-1305957404

LABORATORY MANUAL

No purchase will be required. Instructions for laboratory exercises have been posted to the Desire2Learn website. Print them out and read them before lab.

SUPPLEMENTAL MATERIAL

Photocopied handouts may be provided when appropriate. Calculator with root function, logs, antilogs, and exponential notation will be required for exams and homework. *Required for lab:* Safety goggles and shoes.

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. General Chemistry I covers, broadly, chapters 1 through 11 of the textbook. We will define chemistry, distinguish between chemical and physical processes, and introduce some simple chemical concepts. Next semester we will continue to examine important concepts in chemistry.

At Millersville University the two semesters of freshman chemistry are numbered CHEM 111 and CHEM 112. The general outline of coverage for each semester is:

CHEM 111

- Chapter 1: Chemical foundations
- Chapter 2: Atoms, molecules, and ions
- Chapter 3: Stoichiometry
- Chapter 4: Chemical reactions & solution chemistry
- Chapter 5: Gases & gas laws
- Chapter 6: Thermochemistry
- Chapter 7: Periodicity & electronic structure
- Chapter 8: Bonding: general concepts
- Chapter 9: Bonding: orbitals
- Chapter 10: Liquids and solids
- Chapter 11: Solutions

CHEM 112

- Chapter 12: Chemical kinetics
- Chapter 19: Nuclear chemistry
- Chapter 13: Chemical equilibrium
- Chapter 14: Acid-base chemistry
- Chapter 15: Equilibria in acid-base solutions
- Chapter 16: Solubility and precipitation equilibria
- Chapter 17: Thermodynamic Spontaneity
- Chapter 18: Electrochemistry
- Chapter 20: Representative elements
- Chapter 21: Chemistry of transition metals (as time permits)

COURSE OBJECTIVES

1. To introduce to the student the principles, laws, and theories of chemistry.
2. To provide the student with a theoretical and empirical understanding of the principles, laws and theories of chemistry.
3. To develop in the student the ability to think critically and to solve quantitative chemical problems and to promote original thought on the part of the student and encourage the use of logic in the solution of problems.
4. To develop an ability in the student to learn and work independently as well as learning and working with a team of peers.
5. To illustrate, in a laboratory setting, the fundamental laws of chemistry.
6. To develop in the student an appreciation for laboratory safety and environmental sensitivity.

GRADING

Grading will be as follows: A 1000-point scale will be used to determine the final grade. The lecture portion of the course is worth 75% of the overall grade and the

lab portion is worth 25%. For the lecture portion of the course, there will be four regular examinations, each worth 10% of your overall course grade. The final exam will be worth 20% of your overall grade. Additionally, there will be on-line assessments in the Desire2Learn environment which will be worth 15% of the overall grade.

In the lab portion of the course, experimental results (nine data sheets which are multipage ***Reports*** from the lab manual) will be worth 15 points each. Quizzes will be worth 10 points each. Quizzes will be given at the beginning of lab period. The purpose of the quiz is to encourage to come to lab prepared, as preparation affects lab safety and efficiency. Be sure to read the handout before coming to lab. The lab notebook is 25 points. Using this simple 1000-point scale you will be able to assess your performance at any point in the semester.

The maximum possible points are as follows:

Exam 1	100	Lecture: 750 points
Exam 2	100	
Exam 3	100	
Exam 4	100	
Final Exam	200	
On-line/in-class components	150	
Data sheets (9)	135	Lab: 250 points
Pre-lab questions (9)	90	
Lab notebook	25	
Total	**1000 points**	

1000 – 925 A, 924 – 895 A-
894 – 865 B+, 864 – 825 B, 824 – 795 B-
794 – 765 C+, 764 – 725 C, 695 – 724 C-
694 – 665 D+, 664 – 625 D, 595 – 624 D-
594 – 0 F

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.

HOMEWORK

Approximately ten 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 homework 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 ten assessments will be administered using the Desire2Learn software. Be sure to log on at Desire2Learn(weblink) very soon after the first class meeting. Be sure to follow all instructions for submitting assessments. Pay close attention to the due dates.

LABWORK

Data Sheets (Reports): Your completed data sheets are due at the end of each class. All data sheets are graded on a twenty-point basis. You will be graded on the precision of your answers and how completely you answer the questions.

LABORATORY NOTEBOOK

Permanently bound notebook (spiral or ring binders are not acceptable). Bound notebooks are available in the campus bookstore, on-line, or at retail stores. The notebook should have a table of contents at the beginning, containing the experiment title, the page on which each experiment begins, and the date(s) during which the experiment was performed.

The pages should be numbered, and no pages should ever be removed from the notebook. At the beginning of a new experiment, write a few sentences in the notebook about the purpose of the experiment, the method used, and any partners with whom you will work.

Mistakes are indicated by a single line drawn through them, never by obliterating them beyond recognition, since experimenters often decide later that what was thought to be a mistake was not really a mistake. Observations and data should be recorded directly into the notebook as you are performing the experiment. Do not write on paper towels or scrap paper and transfer to the notebook later. This would defeat the purpose of the notebook as a primary source of data. Organize your notebook beforehand when possible by labeling and leaving blanks for experimental parameters that must be recorded, and by making tables for data ahead of time. If you are unsure whether a piece of information should go into the notebook, write it in there. You cannot have too much information. If you have misgivings about the accuracy or precision of the data, or if something went wrong during the experiment, write that in the notebook as well. Later, you will not remember which data you trust and which you do not. Explanatory notes, units, and labels are always important, as is legibility.

INSTRUCTIONS FOR LABORATORY EXERCISES

Please arrive on time, as you will not be given extra time to finish the experiment beyond the designated time. *Please read the experiment before coming to lab.* You will have an idea about what to expect in the laboratory and you will feel more comfortable with the experiment. It is never a good idea to read the

experiment, for the first time, as you are performing the laboratory exercise. In order to motivate your lab preparation, each lab meeting will begin with a quiz.

Data sheets with complete calculations are due at the conclusion of each lab. It is expected that all students will complete all laboratory exercises, and all labs will count toward the final lab grade as described above.

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. *Attendance is necessary in all lab meetings. If you cannot attend lab, due to illness or other emergency, you must contact me before the class period, or as soon thereafter as possible.* The last day to drop this course without penalty is April 3. See http://www.millersville.edu/registrar/academic-calendar/ for important dates.

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.

Spring 2026 ***Tentative Examination Schedule (subject to change):***

Day	Date	Topic
Friday	February 6	Chapters 1 – 2
Friday	February 27	Chapters 3 – 4
Friday	March 27	Chapters 5 – 6
Friday	April 24	Chapters 7 – 9

Final exam over chapters 1 – 11: Friday, May 8, 8:00 – 10:00 am

The schedule for laboratory experiments appears on the following page.

Spring 2026 ***Tentative Lab Schedule for Wednesday (section A):***

January 21 – Laboratory safety. Check into lockers. Glassware identification.

January 28 – Separating Substances, Measuring Mass, & Analyzing Data (Pages 13-22).

February 4 – Measuring Volumes (Pages 23-33).

February 11 – Reaction Types & Qualitative Analysis (Pages 34-41).

February 18 – Reaction Types & Qualitative Analysis (Pages 34-41), continued.

February 25 – What is contaminating the water supply? (Pages 42-44).

March 4 – What is contaminating the water supply? (Pages 42-44), continued.

March 11 – Spring Break; no laboratory meeting

March 18 – Titrations (Pages 45-55).

March 25 – What is the acidity of vinegar? (Pages 56-59).

April 1 – What is the acidity of vinegar? (Pages 56-59), continued.

April 8 – Absorption Spectroscopy (Pages 60-73).

April 15 – Molecular Models (Hand Out: Experiment 13).

April 22 – What is the Dye Composition of a drink? (pages 74-78).

April 29 – What is the Dye Composition of a drink? (pages 74-78), continued.

May 6 – Final Exam week. No laboratory experiments this week.

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 TitleIX(weblink).