

Instructor: Dr. Jeremiah K.N. Mbindyo
Email: Jmbindyo@millersville.edu

Office: Caputo 321
Office hours: **Mon** 10-12p, **Tue** 12:10-1:10 p.
Wed 10-12 p. Other times can be set by arrangement in person or email.

Class hours: Lecture: M, W, F 9-9:50 a

Venue: Brossman 102.

Recitation:

111.02A Wed 2:00 - 2:50 p.m.- Roddy 153 - (Dr. Mbindyo)

111.02B Thur 9:00 -9:50 p.m. - Roddy 153 - (Dr. Mbindyo)

111.02C Thur 1:10 - 2:00 p.m. - Roddy 153 - (Dr. Mbindyo)

Lab:

111.01A Wed 3:00 - 4:50 p.m. CAP 328 - (Dr. Elioff)

111.01B Thur 10:00 -11:50 p.m. CAP 328 - (Dr. Schiza)

111.01B Thur 2:10 - 4:00 p.m. CAP 328 - (Dr. Mbindyo)

Required materials:

1. Textbook: Chemistry, 2e from OpenStax, <https://openstax.org/details/books/chemistry-2e>. Print ISBN 194717262X, Digital ISBN 1947172611. You can access the textbook online in the web view (recommended) or download as a PDF for free. The book can also be purchased on iBooks, from campus bookstore, OpenStax, Amazon or any other source online.
2. Calculator: A simple calculator that can do scientific notation, logarithms, and exponents.
3. You are required to access D2L and check your Millersville email regularly.

Lab:

1. Textbook: Chemistry Techniques and Explorations, Daniel R. Albert; OpenStax, 2023. <https://paadopt.org/bookshelf/chemistry-techniques-and-explorations-an-introductory-chemistry-laboratory-manual/>
2. Supplementary materials will be posted in D2L
3. Lab Notebook: Must be bound (no ring binders) approximate size 7 x 9.5", quadrille ruled. Carefully follow the instructions for the laboratory notebook on pages 8 through 10 of the laboratory manual.
4. Lab safety goggles.

Catalog Description

The properties and theories of the solid, liquid and gaseous states of matter, the stoichiometry and thermochemistry of chemical reactions, and theories and applications of molecular structure and bonding. Proficiency in algebra is essential. High school chemistry is strongly recommended. Intended for science majors: biology, chemistry, earth sciences, physics. 3 hrs. lec., 1 hr. discussion, 2 hrs. lab. Prereq: CPT of CHEM 111 or CHEM 110 with a grade of C- or higher; and MPT of MATH 160 or higher or MATH 101 with a grade of C- or higher; or permission of instructor.

This course detailed study of Chemistry for students majoring in chemistry, biology, earth science, physics, computer science and some applied engineering options. The course format is three 50 minute lectures/discussion meetings per week, 1 hour of recitation and equivalent of 2 hours of lab. You are expected to attend all class meetings and to participate and contribute to discussions.

Learning outcomes. By the end of the course, you should be able to:

1. Explain the properties of atoms, molecules, and the various states of matter
2. Describe the atomic structure and the periodicity of elements in the periodic table
3. Solve problems in chemical stoichiometry and demonstrate a clear understanding of the mole concept.
4. Discuss precipitation, acid/base and redox reactions
5. Demonstrate an understanding of "gas laws"
6. Demonstrate an understanding of thermochemistry and energy changes in chemical reactions.
7. Explain molecular bonding and simple quantum mechanical treatments of atoms and molecules
8. Explain current bonding models for simple inorganic and organic molecules in order to predict structures and important bonding parameters
9. how to predict molecular geometries of selected molecular species
10. properties of solids, liquids and solutions and intermolecular force

Course Policies

Lecture

We will meet 3 times a week for a 50 min lecture/discussion.

Homework

You will be assigned homework problems covering materials in each chapter. Homework will not be collected for grading. However, quizzes will have some questions very similar to those in the practice problems and homework. Solutions can be found in the student resources section for the class textbook. You need sign and download.

Recitations

During recitation, you will be assigned problems to work on. I will be available to answer questions as you work through the problems. The last part of recitation will be a brief review of the lab to be performed on that day.

Quizzes

In general, quizzes will be given on Fridays. This may however change depending on the flow of the materials covered in class.

D2L and email

Course communications by email will be through your Millersville University account. You need to check your email regularly. You also need to logon to D2L regularly to access course materials and information.

Attendance

You are expected to attend all classes Absences can be excused for illness, family emergencies or university activities. You should notify me in advance, by email, and in person if you anticipate an unavoidable absence for any of these reasons. It is your responsibility to make up any work missed when you were absent. Handouts, tests, assignments etc. given out during an absence can be picked from my office during office hours. If a test or quiz is missed during an excused absence, the final exam score will be substituted for the missed work. Quizzes, or tests missed due to unexcused absence cannot be made up. Participation review problems cannot be made up due to absence in class.

Decorum

Talking or distracting others during lectures is not permitted. Anyone doing so may be asked to leave the class. You are expected to treat other students and the instructor with respect always. I reserve the right to take disruptive behavior such as talking or whispering to others distractively in class, use of cell phones, other forms of distraction, habitual lateness, inappropriate language etc. into account in determining your final grade, and to pursue appropriate actions per university guidelines.

Study Habits

You should plan to study chemistry every day, including weekends for at least 1.5 hours. Read the chapter being covered in lecture in detail to increase your understanding of the material. Review course notes briefly after each lecture and circle anything that seems important to reinforce later. Solve the assigned homework problems until you are confident that you can answer similar questions. Do not just work towards the answer. Do not spend your whole study time working on only one problem. If you cannot figure something out, it is usually helpful to talk to someone else in the class who may know the answer, then at the earliest opportunity come to office hours if you still have problem understanding the concept. Planning on studying alone throughout the course is not advisable. If you help someone to understand a concept, you are much more likely to remember it better.

Tutoring and Peer Learning

You are encouraged to take advantage of tutoring and Peer Learning hours offered by the Chemistry department at the following times: Tues. 5 - 7 pm; Wed. 5 - 7 pm.; Thur. 5 - 7 pm in Caputo 211 starting January 28th. You do not need an appointment. Just drop in and you can work on chemistry with your peers and the support of helpful and knowledgeable upper-level students. Contact Dr. Rajaseelan (erajaseelan@millersville.edu) with any questions/concerns You can also contact the tutoring center in Lyle Hall Room 355 (<https://www.millersville.edu/tutoringcenter/files/tutoring-brochure.pdf>). Tel: 717-871-7222 to be matched to a personal tutor. Tutoring is free. Take advantage.

Exams

There will be 3 hour exams and 1 final exam.

Grading Criteria:

Your grades will be calculated as follows:

Item	%	pts
Quizzes	25	250
3 Hour Exams	30	300
Final Exam	25	250
Lab	20	200
Total	900	900

Grade distribution:

A	90-100%	A-	88-89%	B+	85-87%	B	80-84%
B-	78-79%	C+	75-77%	C	70-74%	C-	68-69%
D+	65-67%	D	64-65%	D-	60-63	F	< 60%

A grade of C- or better is required to enroll in CHEM112 (C or better is required to enroll in CHEM 112 for chemistry majors). You must have a grade of at least D- lecture and at least D- in lab to pass the class.

Tentative order of topics

Chap 1	Essential Ideas
Chap 2	Atoms, Molecules and Ions
Chap 3	Composition of Substances and Solutions
Exam 1 - Feb 14	
Chap 4	Stoichiometry of Chemical Reactions
Chap 6	Electronic Structure and Periodic Properties of Elements
Chap 7	Chemical Bonding and Molecular Geometry
Chap 8	Advanced Theories of Covalent Bonding
Exam 2 - March 21	
Chap 10	Liquids and Solids
Chap 9	Gases
Chap 5	Thermochemistry
Exam 3 - April 18	
Chapter 11	Solutions and Colloids
Final Exam - Wednesday, May 7th, 8-10 a.m.	

University Class Attendance Policy

The University supports departmental and faculty class attendance policies that are reflective of and consistent with University approved guidelines. Faculty will include their class attendance policy in their syllabi given to all students in their classes at the start of the semester.

University approved guidelines:

1. **Students are expected to attend all classes.** It is the student's responsibility to complete all course requirements even if a class is missed. If a student misses class for an officially excused reason, then he/she is entitled to make up the missed work but only at the convenience of the faculty member. Responsibility for materials presented in, assignments made for, and tests/quizzes given in regularly scheduled classes lies solely with the student.
2. **The University policy is that faculty will excuse absences for the following reasons:**
 - a. personal illness,
 - b. death or critical illness in the family,
 - c. participation in a university-sponsored activity,
 - d. jury duty,
 - e. military duties, or
 - f. religious holidays
3. **Faculty judge the validity of student absences from class within the University's approved guidelines and may require documentation for excused absences.** Faculty will evaluate any reason, other than those listed above, for a student missing class and determine whether the absence is justified. In these circumstances, a student may make up missed work at the discretion of the instructor.
4. **In the case of foreseeable absences, students are encouraged to notify the faculty member in advance.** A student who will miss class due to participation in an official University activity must notify the instructor well in advance of the activity to assure that the absence is excused.

Appeals:

As with any academic issue, students may exercise their right to appeal adverse attendance decisions. Please refer to the current undergraduate catalog for the complete Academic Appeal procedure.

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, comply with Title IX of the Education Amendments of 1972, 20 U.S.C. §1681, et seq., and act in accordance with guidance from the Office for Civil Rights, the University requires faculty members to report to the University's Title IX Coordinator incidents of sexual violence shared by students.

The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report to the person designated in the University Protection of Minors policy incidents of 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.

Information regarding the reporting of sexual violence, and the resources that are available to victims of sexual violence, is available at <http://www.millersville.edu/socialeq/title-ix-sexual-misconduct/index.php>.

TENTATIVE LAB SCHEDULE

CHEM 111.02A – Wed 2:00-3:50 p (Dr. Elioff)

Jan-22	Measuring Volumes – Technique (Pages 23-33).
Jan-29	Separating Substances - (Pages 13-22)
Feb-05	Formula and Composition of a Hydrate; Part A - Handout
Feb-12	Formula and Composition of a Hydrate; Part B – Hand out
Feb-19	Titrations – (Pages 45-55)
Feb-26	What is the Acidity of Vinegar? – (Pages 56-59)
Mar-05	Spring Break
Mar-12	What is the Acidity of Vinegar? – (Pages 56-59)
Mar-19	Molecular Models and Covalent Bonding - Handout
Mar-26	Absorption Spectroscopy - (Pages 60-73)
Apr-02	Reaction Types and Qualitative Analysis – (Pages 34-41).
Apr-09	Reaction Types and Qualitative Analysis – (Pages 34-41).
Apr-16	What is Contaminating the Water Supply? – (Pages 42-44)
Apr-23	What is Contaminating the Water Supply? – (Pages 42-44)
Apr-30	Measuring Volumes – Technique (Pages 23-33).

CHEM 111.02B – Thur 10 a-11:50 a.m. Dr. Schiza

Jan-23	Lab safety, Record keeping, check-in - (Pages 8-12)
Jan-30	Measuring Volumes – Technique (Pages 23-33).
Feb-06	Separating Substances - (Pages 13-22)
Feb-13	Formula and Composition of a Hydrate; Part A - Handout
Feb-20	Formula and Composition of a Hydrate; Part B – Hand out
Feb-27	Titrations – (Pages 45-55)
Mar-06	What is the Acidity of Vinegar? – (Pages 56-59)
Mar-13	Spring Break
Mar-20	What is the Acidity of Vinegar? – (Pages 56-59)
Mar-27	Molecular Models and Covalent Bonding - Handout
Apr-03	Absorption Spectroscopy - (Pages 60-73)
Apr-10	Reaction Types and Qualitative Analysis – (Pages 34-41).
Apr-17	Reaction Types and Qualitative Analysis – (Pages 34-41).
Apr-24	What is Contaminating the Water Supply? – (Pages 42-44)
May-01	What is Contaminating the Water Supply? – (Pages 42-44)

CHEM 111.02C – Thur 2:10 p – 4:00 p.m. (Dr. Mbindyo)

Date	Topic
Jan-23	Lab safety, Record keeping, check-in - (Pages 8-12) -
Jan-30	Measuring Volumes – Technique (Pages 23-33).
Feb-06	Separating Substances - (Pages 13-22)
Feb-13	Formula and Composition of a Hydrate; Part A - Handout
Feb-20	Formula and Composition of a Hydrate; Part B – Hand out
Feb-27	Titrations – (Pages 45-55)
Mar-06	What is the Acidity of Vinegar? – (Pages 56-59)
Mar-13	Spring Break
Mar-20	What is the Acidity of Vinegar? – (Pages 56-59)
Mar-27	Molecular Models and Covalent Bonding - Handout
Apr-03	Absorption Spectroscopy - (Pages 60-73)
Apr-10	Reaction Types and Qualitative Analysis – (Pages 34-41).
Apr-17	Reaction Types and Qualitative Analysis – (Pages 34-41).
Apr-24	What is Contaminating the Water Supply? – (Pages 42-44)
May-01	What is Contaminating the Water Supply? – (Pages 42-44)