

CHM 109

Lecture:	Section A	MTWTh	9:00 – 9:50 a.m.	LTT 102
Discussions:	Section A1	Th	11:00 – 11:50 a.m.	PAD 168
	Section A2	Th	1:00 – 1:50 p.m.	PAD 107
	Section A3	F	9:00 – 9:50 a.m.	PAD 107
	Section A4	F	11:00 – 11:50 a.m.	PAD 261
Labs:	See pages 3 and 4 of syllabus.			
Office Hours:	T 10 – 12, W 11 – 12, Th 2 – 3, or by appointment			
Required Texts:	<i>Introductory Chemistry</i> by Cracolice and Peters, 2 nd Edition <i>Laboratory Experiments for Chemistry 109</i> by Tanis OWL Card			
Other Materials:	You will need a scientific calculator (with scientific or exponential notation) for lecture, discussion, and lab.			
Special Note:	If you have any special needs due to a learning, physical, or other disability, please contact the office of Academic Support (OAS) at 331-2490 and me.			

Welcome to Introductory Chemistry at Grand Valley State University! The study of chemistry can be an exciting and rewarding experience when students and instructors work together to structure a positive environment that fosters learning.

CATALOG DESCRIPTION

Introductory Chemistry: An introductory study of general chemistry that presents the basic chemical principles and their applications. Designed for general education and students in programs that require a chemistry background but not the rigor of a full year of general chemistry. Does not count toward a chemistry major. Prerequisite: MTH 097 or concurrent enrollment. Fulfills Physical Sciences Foundation. 4 hours lecture, 1 hour discussion, 2 hours laboratory per week. 5 credits.

GENERAL EDUCATION FOUNDATION CATEGORY: PHYSICAL SCIENCES

Category purpose and Description. The physical sciences explore and seek to explain the behavior of the physical universe. They seek to understand the fundamental workings of nature, from the behavior of particles of matter to the functioning of the galaxies. Study of the concepts, history, contexts, and methodologies of the physical sciences assists students in becoming scientifically literate. Each course in this category is a broad introduction to one or more of the physical sciences. Courses contribute to the development of critical thinking and problem solving skills, and help students apply an understanding of scientific ways of thinking to their own lives and careers.

Content Objectives

1. The introduction of the physical sciences as a “way of knowing”; an examination of principles and questions that define the field;
2. An understanding of how scientists use information and theory to explain the phenomena observed in the physical universe;
3. The unifying concepts of the physical sciences including the forces of nature, the structure of materials, and the role of energy in the physical universe.

Skills Objectives. This course uses teaching methods that help students become more proficient in the following skills:

1. To engage in articulate expression through effective speaking or writing;
2. To think critically and creatively;
3. To locate, evaluate and use information effectively.

COURSE OBJECTIVES

Upon completion of this course, you will be able to:

1. Understand the basic relationships between matter and energy.
2. Accurately use the language and symbols of chemistry to describe chemical processes.
3. Understand atomic theory, electronic structure and chemical bonding.
4. Write chemical equations and calculate quantities of chemicals involved.
5. Understand kinetic molecular theory and the properties of gases, liquids and solids.
6. Describe the properties of solutions and determine the concentrations of solutions.
7. Understand the concepts of pH, acids, bases, salts and their reactions.
8. Describe the factors that influence the rate of a chemical reaction and the concept of chemical equilibrium.
9. Understand the basic concepts involved in oxidation and reduction reactions.

LECTURE

Attendance at lectures is essential and expected. During lecture I will present concepts, show animations/movie clips, perform demonstrations and provide opportunities for you to construct new knowledge and begin to practice new skills. Lectures will include critical group activities and group quizzes (see "Discussion"). To prepare for lectures, read the suggested pages in your text. Lecture outlines are available on our Blackboard course site under "Lectures" at least 2 days prior to each lecture. Print the outlines and bring them to lecture. During lecture, take notes on your outlines. Study tip: After lecture, read the text again along with your completed notes, work the relevant end of chapter problems, and complete the OWL online homework for that chapter. The lecture schedule below, with the exception of exam dates, is subject to change.

Please remember to turn off your cellular phone or pager prior to coming to class.

Tentative Lecture Schedule

<i>Dates</i>	<i>Textbook</i>	<i>Topic</i>
Aug. 30	Chapter 1	Introduction to Chemistry
Aug. 31, Sept. 1	Chapter 3	Measurement and Chemical Calculations
Sept. 2, 8, 9	Chapter 2	Matter and Energy (<i>Labor Day Recess is Sept. 4-7</i>)
Sept. 13, 14, 15	Chapter 5	Atomic Theory: The Nuclear Model of the Atom
Sept. 16, 20	Chapter 6	Chemical Nomenclature
Sept. 21, 22	Chapter 7	Chemical Formula Relationships
Sept. 23	Exam I	Chapters 1, 3, 2, 5, 6
Sept. 27	Chapter 7	Chemical Formula Relationships
Sept. 28, 29, 30, Oct. 4	Chapter 8	Reactions and Equations
Oct. 5, 6, 7	Chapter 9	Quantity Relationships in Chemical Reactions
Oct. 11, 12	Chapter 10	Atomic Theory: The Quantum Model of the Atom
Oct. 13	Exam II	Chapters 7, 8, 9
Oct. 14	Chapter 10	Atomic Theory: The Quantum Model of the Atom
Oct. 18, 19, 20	Chapter 11	Chemical Bonding
Oct. 21, 25, 26	Chapter 12	The Structure and Shape of Molecules
<i>Oct. 22, 5 p.m.</i>	*****	<i>Last day to DROP with a "W"</i>
Oct. 27	Chapter 4	The Gas Laws
Oct. 28, Nov. 1	Chapter 13	The Ideal Gas Law and Its Applications

Nov. 2	Exam III	Chapters 10, 11, 12
Nov. 3	Chapter 13	The Ideal Gas Law and Its Applications
Nov. 4, 8	Chapter 15	Gases, Liquids and Solids
Nov. 9, 10, 11	Chapter 16	Solutions
Nov. 15, 16, 17	Chapter 17	Net Ionic Equations
Nov. 18	Exam IV	Chapters 4, 13, 15, 16
Nov. 22, 23, 29	Chapter 20	Chemical Equilibrium (<i>Thanksgiving Recess Nov. 24-28</i>)
Nov. 30, Dec. 1, 2, 6	Chapter 18	Acid-Base Reactions
Dec. 7, 8, 9	Chapter 19	Oxidation-Reduction (Redox) Reactions
Tuesday, Dec. 14	8:00-9:50 a.m.	FINAL EXAM

HOMEWORK

Non-graded homework problems (end of chapter exercises) will be assigned regularly, and can be found at the top of the lecture outlines. The purpose of these assignments is to allow you to practice the kinds of questions that will help you gauge your understanding of the material. Quiz and exam questions are often modeled after the homework exercises.

Web-based interactive homework assignments (OWL) are required. You will log into the web site so the program can track which assignments you have completed. Each of the assignments consists of several lessons. Partial credit is assigned for partial completion of the lesson. In order to earn full credit on your online homework, you must master 80% of each OWL assignment. Instructions for accessing these lessons through the web will be given during the first week of class and are posted on our Blackboard course site.

DISCUSSION

During these weekly meetings, you will have the opportunity to ask questions, practice problems, and participate in class discussions and activities about the material in a smaller class setting. Individual quizzes will be given during each discussion period. At your first discussion meeting, you will be placed into a group and be expected to sit with the members of your group in lecture in order to participate in group activities and quizzes.

LABORATORY

In the laboratory, you will have the opportunity to experience the concepts from lecture and your text as you apply chemical techniques to solving chemical problems. A passing laboratory grade is required.

Eye protection must be worn at all times when working in the lab. Safety goggles will be supplied for you. Because of dangerous fumes sometime present in labs, contact lenses are not recommended. If you must wear contact lenses, see your instructor for additional safety procedures. This lab uses few reagents that are hazardous and following correct safety procedures will assure a safe lab experience. Nevertheless, pregnant students may wish to take extra precautions. If you have concerns, see your lab instructor. Students will work in pairs on each experiment. The lab reports and questions are to be prepared individually. Copying lab reports will result in a grade of zero assigned to both individuals involved.

Students must complete the pre-lab assignment for each lab and review the experiment procedure BEFORE attending the lab. This will help prevent costly mistakes or accidents and will allow the completion of the lab on time. The pre-lab assignment sheet must be turned in at the beginning of the lab or you will not be allowed to perform the experiment. Lab reports must be turned in at the end of the lab period. In order to receive full credit for a lab, the pre-lab question sheet and lab report must (1) show all calculations with proper units, (2) be correct, (3) be neat and (4) be turned in on time. Attendance for "wet lab" experiments is mandatory. Opportunities to make up missed labs are extremely limited. Refer to your lab manual for detailed procedures, policies, and safety rules for the chemistry laboratory.

Lab Schedule (337 PAD)

Your lab meets seven times during the semester. Note the section number of your lab and if it is odd or even to determine which dates you meet. Example: Students in section #35 (odd) meet on Tuesdays at 10 a.m. on Aug. 31, Sept. 21, Oct. 5, Oct. 19, Nov. 2, Nov. 16, and Nov. 30.

Lab	Title	Odd Sections	Even Sections
1	Measurement and Significant Figures	Aug. 30-Sept. 3	Sept. 8-14
2	Composition of a Mixture	Sept. 15-21	Sept. 22-28
3	Synthesis and Determination of a Formula	Sept. 29-Oct. 5	Oct. 6-12
4	Chemical Reactions	Oct. 13-19	Oct. 20-26
5	Measurement of Density	Oct. 27-Nov. 2	Nov. 3-9
6	The Determination of the Molar Mass	Nov. 10-16	Nov. 17-23
7	The analysis of Household Vinegar	Nov. 29-Dec. 3	Dec. 6-10

COURSE GRADES

Four Midterm Exams (100 points each)	400
Best 10 Discussion quizzes (10 points each)	100
Group Quizzes (lowest 2 are dropped)	50
Seven Labs (15 points each)	105
Online Homework (OWL)	70
Final Exam	<u>150</u>
Total	875 points possible

- *Midterm Exams:* Four 100-point exams will be given. Because the course content builds during the semester, you can expect each exam to be somewhat cumulative in nature. NO exams will be dropped, and there are no make-up exams
- *Special Circumstances:* None of the midterm exams will be dropped. Therefore, it is imperative that you be present for every exam, and plan travel and other events accordingly. An alternate exam may be administered prior to the scheduled time *only* in cases where travel for a university sanctioned business or function, which cannot be rescheduled, interferes with an exam date. *If such plans do interfere with an exam date, then it is your responsibility to schedule an alternate exam date prior to the scheduled date. This alternate date must be finalized at least two weeks prior to the scheduled exam date.* You must show proper documentation from the appropriate university official for an early exam to be administered. In cases of sudden illness or an unanticipated emergency that prevents you from attending a scheduled exam, the final exam percentage will be substituted. *This option can only be exercised once. A second missed exam will be scored as a zero.*
- *Final Exam:* Your final exam will be worth 150 points. You are rewarded for demonstrating your mastery of the content at the end of the course. If your final exam score, based on 100 points, is better than one of your earlier exams, I will replace the score with your final exam grade. You must take all four midterm exams for the “resurrection” final to apply.
- *Quizzes:* Discussion quizzes, worth 10 points each, will be given during the discussion meeting every week. Group Quizzes, worth 5 points each, will be given in lecture and will not be announced. Lecture quizzes will be graded on a five-point scale. There will be no make-up quizzes.

%	100-93	92-91	90-89	88-81	80-79	78-77	76-69	68-67	66-65	64-57	56-0
Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	E

SUCCESS IN CHEMISTRY

Success is a matter of exposure and practice. Take advantage of the “Discussion Board” on the Blackboard course site. If you have a question that may be of interest to your classmates, post it on the discussion board. I will respond, and I highly encourage all members of the class to get involved and chat about chemistry. I also recommend that you study with others outside of class. If you can explain a concept or idea to someone else, you must understand it first. Share your talents with others and take advantage of the rich talent surrounding you. You can form informal study groups, study with those in your discussion group, or visit the Learning Center, 377 PAD (331-3639), to access MS³ (Math and Science Student Support Services). The services are there to support your math and science study by providing:

- Drop-in office assistance
- Peer support
- Study groups
- Seminars and workshops
- Newsletters containing valuable news and tips
- Connections to university services such as counseling and tutoring
- Information about science and math career opportunities.