

Policies for Principles of Chemistry (Chem 1210) Majors Section

Instructor: Dr. Robert Brown **Class Times/Location:** 10:30-11:20 A.M. MWF/ESLC 053

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Office Hours: Wednesdays from 3:00-4:00 PM and Thursdays from 4:00 - 5:00 PM. You may also contact me to schedule individual appointments at alternate times. Students with questions or problems with course material during the semester are encouraged to come to office hours for help and/or to email me questions.

Course Text: Chemistry: The Central Science (12th Edition preferred) by T.L. Brown, H.E. LeMay, B.E. Bursten, C.J. Murphy, P.M. Wood Prentice Hall, 2012. **Note:** Supplementary material, including lecture notes, will be available online using the Canvas web site (<https://canvas.usu.edu/>). The 11th and 13th edition of the textbook may also be used.

Lecture notes will begin being posted during the first week of classes. Notes may or may not be posted prior to each class. These lecture notes are meant as an additional study aid and are not a substitute for regular class attendance or assigned chapter readings and working suggested chapter problems. The lecture notes may be supplemented by recorded lecture material that should be reviewed prior to each class. Class time saved will then be used to work additional example problems and to discuss specific chapter concepts as needed.

Prerequisite: Successful completion of Math 1050 or higher is required and previous high school chemistry is recommended.

Course Description: Chemistry 1210 is the first semester of a two-semester course of general chemistry intended for students in the natural sciences and engineering. The first semester will cover material in chapters 1-11 and chapter 13 of the text.

Recitations: All students must register for a section of recitation listed in the course schedule (Sections 509 or 510). Recitation sections consist of small groups of students and are conducted by a TA (teaching assistant). This year's teaching assistant will be Shusma Saraf (her email is: sushma.saraf@aggiemail.usu.edu). **One seventh (1/7) of your Chemistry 1210 grade (100 points) is derived from performance in recitation (quizzes and participation).** The recitation setting is designed to help develop the problem solving skills that are needed for class examinations. **Recitation sections will begin during the first week of classes and will meet in W 330 (the 3rd floor Widtsoe Hall Chemistry Library).**

Exams: Three hourly exams (100 points each) will be given during class on the dates indicated on the attached course schedule. The final exam is in-class and counts 200 points and will be comprehensive (currently scheduled for Friday, December 18 from 9:30-11:20 AM in ESLC 053). Exam questions will be in multiple-choice format and will be based upon material covered in class, including assigned readings and suggested homework problems from the text. You are strongly encouraged to both read the text chapters and work the practice problems in the text (especially those that I specifically suggest in class for each chapter). Also, it is helpful to take the practice chapter quizzes available on-line (http://wps.prenhall.com/esm_brown_chemistry_9/) and review the practice exams that will be posted on the course web site. Your class performance ultimately depends on your proficiency under testing conditions. Students with access pin numbers for supplemental

material for other editions of the text may find that material useful, but the material is **not required** (the free 9th edition material is equivalent).

Missed Exam Policy: Missed exams which have documented and acceptable excuses will be made up with a comprehensive exam (based upon all material covered prior to the make up exam date) to be held at the end of the semester at a single time and date to be arranged. Excusable absences include: (1) illness when verified by a note from the Student Health Center or your doctor; (2) a family emergency which will require a note from your academic advisor and (3) any regularly scheduled university activities (e.g., sports teams) **only with prior approval** and a note from the person in charge of the activity stating explicitly the reasons for the absence. Students should notify the instructor in advance, if possible, prior to missing any exam. Students missing an exam will have one week to notify the instructor that they have a valid excuse and to produce the necessary documentation. Missed exams that are not made up will be scored as **zero**.

Grading: Grades will be assigned according to the results from the three in class exams, the sum of the top 10 recitation quiz scores, the sum of the top 10 in-class assignment scores and the final examination using the following point distributions:

Exam I	100 points
Exam II	100 points
Exam III	100 points
10 Graded in-class assignments (10 points each)	100 points
10 Recitation Quizzes (10 points each)	100 points
Final Exam (Comprehensive)	200 points
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Total	700 Points

Course Grading Scale (percentage of 700 points)

A/A- : 100-88% **B+/B/B-** : 87-77% **C+/C/C-** : 76-60% **D** : 59-50% **F** : below 50%

Note: Grade cutoffs may change to lower percentages (but not higher) depending upon the exact class exam averages.

Also Note: the attached lecture schedule is tentative. I will attempt to follow it as closely as possible with respect to lecture topics and exam material. However, any changes as to the exact material to be covered in lecture and on each exam will be announced in-class. It is therefore extremely important for you to attend class regularly.

Course Withdrawal: Students may withdraw from Chemistry 1210 as outlined in the most recent edition of the Utah State University General Catalog ([http:// http:// catalog.usu.edu/](http://catalog.usu.edu/)) and the most recent academic calendar (<http://www.usu.edu/calendar/academic.cfm>).

Additional Provisions: The administration of Chemistry 1210 will adhere strictly to the Academic Policies and Procedures outlined in the current Utah State University General Catalog: (<http://catalog.usu.edu/content.php?catoid=8&navoid=1571>).

Course Learning Objectives

General course learning objectives include:

1. Develop knowledge of key facts as outlined during the course.
2. Develop a suitable knowledge of the vocabulary of chemistry.
3. Ability to explain chemical and physical properties using the periodic table.
4. Ability to explain chemical and physical properties of macroscopic materials in terms of microscopic (atomic and molecular) structure.
5. Be able to explain chemical and physical properties of materials based upon their quantum structure.
6. Explain shapes of molecules based upon their electronic structure.
7. Relate physical properties of materials to the shape of the constituent molecules.
8. Provide a microscopic description of the 3 common phases of matter.
9. Perform quantitative stoichiometric calculations interchangeably using mass, moles, volumes, etc.

Some additional specific course learning objectives include (but are not limited to):

Describe units of measurement for mass, length, velocity, time
Use the metric system of units and perform conversions mathematically
Perform calculations utilizing correct significant figures
Identify and describe the particles inside an atom and describe the structure of an atom
Know the Periodic Table in relation to: atomic number; atomic mass; valence electrons
Be able to name simple atoms and general ionic and molecular compounds
Balance chemical equations
Differentiate between a chemical formula and an empirical formula
Define units of solution concentration
Define an acid, a base, a salt, and electrolyte
Calculate formula weights and perform stoichiometric calculations
Determine theoretical yields and experimental yields
Utilize the First Law of thermodynamics and Hess's Law
Be able to calculate enthalpies of balanced chemical reactions
Describe the nature of electromagnetic radiation
Describe the origin of line spectra and how they lead to quantum numbers
Describe Bohr orbitals and the structure of a many-electron atom
Describe the shapes of the Atomic Orbitals (s, p, d, f)
Utilize the Periodic Table to predict atomic trends in size and ionization energies
Draw Lewis diagrams for atoms and polyatomic species
Describe the Octet Rule and draw resonance structures
Predict molecular shapes using the Valence Shell Electron Repulsion Model
Predict molecular polarity
Differentiate single, double, and triple bonds and estimate relative bond energies
Describe the notion of hybrid orbitals and when this approximation works
Describe the properties of gases
Utilize the gas laws of Boyle, Charles, and Avogadro to calculate gas properties
Perform calculations using the Ideal Gas Law and understand its limitation
Describe and differentiate between the solid, liquid, and gas phases
Define the term colligative property
Show how vapor pressure of a solvent is affected by solute concentration

Assessment Strategies

Students in Chemistry 1210 are expected to develop proficiency in the general and specific learning objectives listed above. In order to gauge the effectiveness of the Chemistry 1210 course, selected questions from the various exams, quizzes, and take home problems will be used to assess the class understanding of these principles. Please note that assessment is a tool used by the Department of Chemistry and Biochemistry only to improve the quality of instruction and proficiency of our students and does not impact class grades.

In accordance with the Americans with Disabilities Act, reasonable accommodation will be provided for all persons with disabilities in order to ensure equal participation in Chemistry 1210. A student who requires an accommodation must contact the Instructor. The disability must be documented by the Disability Resource Center. In cooperation with the Disability Resource Center, reasonable accommodation will be provided for students with Disabilities. Course material may be requested in alternate formats through the Disability Resource Center.