**Instructor reserves the right to alter course schedule as the semester progresses. Students will be given advance notice (at least 1 week) of any change.**

**COURSE DESCRIPTION**

One-semester course in general chemistry, especially for non-science majors in the health sciences except pre-medicine and medical technology. (Credit not allowed for both CHEM 111 and CHEM 121L.) Meets New Mexico Lower Division General Education Common Core Curriculum Area III: Science (NMCCN 1114).

Prerequisite: ACT => 22 or SAT => 510 or MATH 103 or MATH 121 or MATH 150 or MATH 162 or MATH 163 or MATH 180 or MATH 181 or MATH 264.

**COURSE MATERIALS**

- **Access to UNM Learn and UNM email:** Additional materials will be posted on UNM Learn and important class announcements will be made to your UNM email address.

- **A non-programmable scientific calculator** with log/antilog and exponential functions
  - TI-30Xa  TI-30X IIS  TI-30XS  Casio or Sharp equivalents

  [http://www.vrcworks.net/blog/how-to-identify-calculator-is-programmable-or-non-programmable-calculator/](http://www.vrcworks.net/blog/how-to-identify-calculator-is-programmable-or-non-programmable-calculator/)

**COURSE POLICIES**

- **55%** Scores/Grades from HS Chemistry Instructor
- **35%** 6 Exams
- **10%** Comprehensive Final Exam (required)
  - If a student doesn’t take the Final Exam, an “F” grade will be recorded.

- **Exams** There are 6 scheduled in-class exams. Before every Exam, approximately a week in advance, there will be a Practice Exam with the Answer Key for students’ use.

The exam format consists of three types of questions: multiple-choice, short-answer, multiple-part. Each exam contains 110 points. However, your exam grade is based on 100 points.

For example, a student with 85 points on an exam scored out of the 110 points possible would receive a 77% exam grade (a C+ letter grade). However, the 85 points would be scored out of 100 points. The student receives an 85% exam grade (a B+ letter grade).

In this way, a student could lose 10 points on an exam and still get a 100% exam grade; lose 20 points and still receive an A letter grade. A student could even get a perfect 110% exam grade. This would definitely be an advantage when averaging the course grade.
Introduction to Chemistry (4th ed), by Bauer, Birk, and Marks.

1. Matter and Energy
   Exam 1
2. Atoms, Ions, and the Periodic Table
3. Chemical Compounds
   Exam 1 (cont.)
4. Chemical Composition
5. Chemical Reactions and Equations
6. Quantities in Chemical Reactions
   Exam II
7. Electron Structure of the Atom
8. Chemical Bonding
    Exam III
   ~ Spring Break ~
9. The Gaseous State
10. The Liquid and Solid States
11. Solutions
    Exam IV
12. Reaction Rates and Chemical Equilibrium
13. Acids and Bases
    Exam V
14. Oxidation-Reduction Reactions
15. Nuclear Chemistry
    Exam VI
   ~ Finals Week ~

❖ Grades

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**Important Dates & Holidays**

Jan 27th  
Last Day to ADD sections and CHANGE credit hours on LoboWEB

Feb 3rd  
Last Day to DROP without “W” grade and 100% tuition refund on LoboWEB

Mar 12th - 19th  
Spring Break

Apr 14th  
Last Day to DROP without Dean’s Permission on LoboWEB

May 5th  
Last Day to CHANGE grade mode with form

May 12th  
Last day to report removal of Incomplete

May 8th – 13th  
Final Exam Week

**Equal Access Services**

If you have a documented disability or psychological/medical condition that may affect your performance in this class, please register with Equal Access Services as soon as possible so I can provide your accommodations in a timely manner. EAS can provide a quiet place to take exams, additional time, and additional services if there is a documented need. For more information, please see their website at [http://www.unm.edu/~vcadvise/equalaccess.htm](http://www.unm.edu/~vcadvise/equalaccess.htm).

**Academic Honesty**

Each student is expected to maintain the highest standards of honesty and integrity in academic and professional matters. The University reserves the right to take disciplinary action, including dismissal, against any student who is found responsible for academic dishonesty. Any student who has been judged to have engaged in academic dishonesty in coursework may receive a reduced or failing grade for the work in question and/or for the course. Academic dishonesty includes, but is not limited to, dishonesty in quizzes, tests or assignments; claiming credit for work not done or done by others; hindering the academic work of other students; and misrepresenting academic or professional qualifications within or outside the University. Depending on the severity of the offense, students caught cheating may receive a zero on the assignment, be dropped from the course, or receive an ‘F’ in the course. Don’t cheat.

**Sexual Misconduct and Gender Discrimination**

In an effort to meet obligations under Title IX, UNM faculty, teaching assistants, and graduate assistants are considered responsible employees. This designation requires that any report made to a faculty member, TA, or GA regarding sexual misconduct or gender discrimination must be reported to the Office of Equal Opportunity and the Title IX Coordinator. For more information on this policy, [https://policy.unm.edu/university-policies/2000/2740.html](https://policy.unm.edu/university-policies/2000/2740.html).
**COURSE TEACHING & LEARNING OUTCOMES**  By the end of this course, student will be able to:

- **1.** Use dimensional analysis, the SI system of units and appropriate significant figures to express quantities, convert units and perform quantitative calculations in science.

- **2.** Diagram the structure of the atom in terms of its subatomic particles; and justify the existence and nature of the subatomic particles and the scale of the nucleus using appropriate experiments from scientific history.

- **3.** Use the IUPAC system of nomenclature and knowledge of reaction types to describe chemical changes, predict products and represent the process as a balanced equation.

- **4.** Apply the mole concept to amounts on a macroscopic and microscopic level and use this to perform stoichiometric calculations including for reactions in solution and gases.

- **5.** Apply the gas laws and kinetic molecular theory to relate atomic level behavior to macroscopic properties.

- **6.** Describe the ways in which atoms combine to form molecules (ionic and covalent). Apply knowledge of electronic structure to determine molecular structure, geometry and hybridization.

- **7.** Analyze how periodic properties (valence, electronegativity, etc.) and reactivity of elements result from electron configurations of atoms.

- **8.** Explain the intermolecular attractive forces that determine physical properties; apply this knowledge to qualitatively evaluate these forces; and predict the physical properties that result.

- **9.** Calculate solution concentrations in various units and explain the effects of temperature, pressure and structure on solubility.

- **10.** Explain rates and rate laws; determine the rate, rate law and rate constant of a reaction; and calculate concentration as a function of time and vice versa.

- **11.** Explain the collision model of reaction dynamics, including activation energy, catalysts and temperature; derive a rate law from a reaction mechanism; and evaluate the consistency of a mechanism with a given rate law.

- **12.** Recognize oxidation-reduction reactions; and identify oxidizing and reducing agents.

- **13.** Describe the dynamic nature of chemical equilibrium and its relation to reaction rates; and apply Le Chatelier’s Principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures.

- **14.** Describe the equilibrium constant and use it to determine whether equilibrium has been established; and calculate equilibrium constants from equilibrium concentrations and vice versa.

- **15.** Describe the different models of acids and base behavior and recognize common acids and bases.

- **16.** Apply equilibrium principles to aqueous solutions, including acid-base and solubility reactions; calculate pH and species concentrations in buffered and unbuffered solutions.

- **17.** Recognize the basic radioactive decay modes, compare the penetrating and ionizing power of various types of radiation, fill in a missing species in a balanced nuclear equation and perform half-life calculations for radioactive isotopes.