

Instructor: Dr. Virginia Chang

Email: vfmchang@unm.edu

Office: VAAS 134

Office Hours: 10:30 – 12:00 pm, Mon & Wed

1:30 – 3:00 pm, Tues & Thurs

Also by Appointment

Mon & Wed Lecture:

12:00 – 1:15 pm, VAAS 127

Mon Lab/Recitation:

1:30 – 3:30 pm, VAAS 128

STEM Center Hours: _____

**** 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.**

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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

❖ **Online homework system with e-book through McGraw-Hill Connect/LearnSmart (LS):** If you do not already have an access code, you may purchase one by going to our course's Connect website (<http://connect.mheducation.com/class/v-chang-501>) and click 'Register.' You will be asked for your email address and then given the option to purchase a bundle containing access to Connect/LearnSmart and the e-book. NOTE: There is also a trial period option. If you choose this, make sure you purchase the full access option before the trial period expires.

❖ **Access to the class text:** *Introduction to Chemistry* (4th ed), by Bauer, Birk, and Marks. You automatically receive access to the e-book upon purchasing the homework system; if you would like a physical copy as well (not required), you may purchase a current or previous edition of the text from any source. The 4th version is the most recent one, but previous versions can be found online for considerably cheaper.

❖ **Access to UNM Learn and UNM email:** Materials will be posted on UNM Learn and important class announcements will be made to your UNM email address. Please check your email regularly. Valencia campus provides internet and computer access at the library, Learning Resource Center, and STEM center.

❖ **A non-programmable scientific calculator** with log/antilog and exponential functions
→ TI-30Xa TI-30X IIS TI-30XS Casio or Sharp equivalents
(cell phones and graphing calculators are not acceptable).

<http://www.vrcworks.net/blog/how-to-identify-calculator-is-programmable-or-non-programmable-calculator/>

❖ **Homework Notebook/Section** to (1) start every new chapter with new vocabulary by *Matching Definitions with Key Terms (available as pdf documents on UNM Learn)*; (2) write down, space out the problems/questions, and to show your work before you submit answers electronically; (3) have it readily available when working with fellow classmate(s), tutor(s) and/or instructor; (4) use as review/study material.

❖ **Lecture and Lab/Recitation Binder(s)** to organize printed material.

CLASS POLICIES

❖ Grades

95-100	A+	85-87	B+	75-77	C+	65-67	D+	55-57	F+
90-94	A	80-84	B	70-74	C	60-64	D	0-54	F
88-89	A-	78-79	B-	68-69	C-	58-59	D-		

Lecture (3-credit hour)

25% Attendance

70% of course grade

25% Homework 50% Exams

Lab/Recitation (1-credit hour)

25% Quizzes

25% Lab

20% of course grade

25% Pre-Lab

25% Post-Lab

Comprehensive Final Exam (required) 10% of course grade

If a student doesn't take the Final Exam, an "F" grade will be recorded.

Final Exam May 8th (Mon) 11:30-1:30 pm VAAS 127

❖ Attendance & Absences

Attendance in lecture and lab/recitation is mandatory.

Students are expected to attend all meetings of the classes in which they are enrolled.

A student with excessive absences may be dropped from a course by the instructor with a grade of WP or WF or the student may receive a grade of F at the end of the semester.

I will exercise my discretion without notice to drop any student who:

- (a) misses the first two lectures and first lab/recitation;
- (b) has not completed any assignments in Connect by the end of the 2nd week;
- (c) after 2 consecutive unexcused absences;
- (d) after 4 total absences.

Students are expected to be on time. Lectures and labs/recitations will begin promptly. After 10 minutes, a student will be counted absent. Late arrival or early departure is unacceptable.

Absences due to illness or any mitigating circumstance are unavoidable but must be documented or approved in advance. If you must miss a lecture or lab, email me ASAP in order to get your absence excused and discuss when you will turn in or make up any allowable assignments. Students are responsible for all assignments regardless of attendance.

An excused absence must be communicated.

Students are limited to 2 excused absences BUT they may not be used for days of Exams.

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❖ Homework

Electronic homework will be assigned regularly and will be available for a week and over a weekend. Your answers (worked out in your Homework Notebook) are to be submitted and scored on Connect. **Late homework will not be accepted.**

❖ Exams

Before every Exam, approximately a week in advance,
there will be a Practice Exam with the Answer Key for students' use.

There are 6 scheduled in-class exams. Here's a tentative schedule:

I – Ch. 1, 2, 3 Wed, 02/01 (3rd week)

II – Ch. 4, 5, 6 Wed, 02/22 (6th week)

III – Ch. 7, 8 Wed, 03/08 (8th week)

IV – Ch. 9, 10, 11 Wed, 03/29 (11th week)

V – Ch. 12, 13 Wed, 04/12 (13th week)

VI – Ch. 14, 15 Wed, 05/03 (16th week)

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. Graded out of the 110 points possible on the exam, the student will receive a 77% exam grade (equivalent to a C+ letter grade). However, the 85 points is graded out of 100 points. The student receives an 85% exam grade. This is equivalent to 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.

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LAB/RECITATION

❖ **Quizzes** At the start of these weekly sessions, there will be scheduled quizzes to assess student knowledge and/or comprehension of previous week's focused activity/exercise within alignment of the course learning objectives.

For our first session, we will focus on ***Scientific Notation, Significant Figures, and Dimensional Analysis***. At the beginning of our second session, there will be a quiz on these topics.

→ Quizzes are anticipated to be scored by and returned to students on Wednesdays.

❖ **Pre-Lab** There will be Pre-Lab reading and questions/problems (*available as pdf documents on UNM Learn*) that need to be completed prior to the weekly sessions. Pre-Labs are submitted at the beginning of our Monday sessions and are anticipated to be scored and returned to students at start of sessions. ***Without a submitted Pre-Lab, students will not be allowed to continue the day's session beyond taking the quiz and will receive no credit for the Pre-Lab and Lab. Students can still do Post-Lab and are expected to take the topic Quiz the next session.*** For our first session, there's no Pre-Lab.

❖ **Lab** These are 2-hour in-class sessions designed for students to practice key chemistry concepts within alignment of the course learning objectives.

→ Labs are submitted at the end of our Monday sessions;
are anticipated to be scored by and returned to students on Wednesdays
so that they are available for student use while completing Post-Labs.

❖ **Post-Lab** Questions and/or Problems (*available as pdf documents on UNM Learn and/or electronic on Connect*) used to review and/or to apply the concepts.

→ Post-Labs are submitted at the beginning of the next Monday session prior to taking the quiz;
are anticipated to be scored by and returned to students on Wednesdays w/ the Quizzes.

CAMPUS POLICIES

❖ Important Dates & Holidays

Jan 27 th	Last Day to ADD sections and CHANGE credit hours on LoboWEB Last Day to CHANGE grade mode on LoboWEB
Feb 3 rd	Last Day to DROP without “W” grade and 100% tuition refund on LoboWEB Last day to ADD sections and/or CHANGE credit hours with form, \$10 per transaction; after this date \$75
Mar 12 th - 19 th	Spring Break
Apr 14 th	Last Day to DROP without Dean’s Permission on LoboWEB
May 5 th	Last Day to CHANGE grade mode with form Last day to DROP with Dean's Permission with form Last Day to ADD sections and/or CHANGE credit hours with forms \$75 per transaction
May 8 th – 13 th	Final Exam Week
May 12 th	Last day to report removal of Incomplete

❖ 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>.

❖ 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>.

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.