

**Chemistry 111- 501 Elements of General Chemistry Summer 2017**

**Mon. & Wed Lecture: 9:00 Am – 11:45 AM**  
**Tue. & Thur. Lecture/Lab: 9:00 AM – 11:00 AM**  
**Office Hours: T-Th 11:00 AM until noon**

**VAAS Room A101**  
**VAAS Room A101/128**

**Instructor: Dr. Alan Thomas**  
**Email: [athomas2@unm.edu](mailto:athomas2@unm.edu)**  
**Office: VAAS 113, #7 (cubicle zone, first on the right)**  
**Office Phone: (505) 925-8629**

**\*\* Course schedule subject to instructor modification during the semester. One weeks' advance notice will be given prior to any schedule changes. \*\***

## Course Description

This is a one semester course in general chemistry, designed especially for non-science majors in the health sciences (except pre-med and med tech majors). Credit is not allowed for both CHEM 111 and CHEM 121L. This course meets New Mexico Lower Division Education Common Core Curriculum Area III: Science (NMCCBN 1114) requirements.

Course Prerequisites: ACT  $\geq 22$  or SAT score  $\geq 510$  or MATH 103, 121, 150, 162, 163, 180, 181, or 264.

## Course Materials

## Electronic textbook and online homework

The textbook for this class is *Introduction to Chemistry* (4<sup>th</sup> edition), by Bauer, Birk, and Marks. This is an electronic (virtual) textbook published by McGraw-Hill. When you purchase access to the McGraw-Hill Connect/ LearnSmart (LS) system you will automatically receive an electronic copy of the textbook. Each student must purchase the access code to the LS system in order to perform their homework for this class. The access code for this class may be purchased at the bookstore on campus or at the McGraw-Hill website. To purchase the access code online use the following link:

<http://connect.mheducation.com/class/a-thomas-chem> 111 summer 2017

If you purchase your access code at the bookstore, you will use the link above to register for the class. If you go directly to this website to purchase the access code, click on the “Register” button you see on the homepage in the lower right-hand corner. You will be queried for an email address. Once you have entered a valid email address, you will be given the option to purchase a bundle containing the access code and textbook for the class.

**\*\*Note:** there is a “Free Courtesy Access” option you will be presented with when purchasing this bundle from McGraw-Hill. If you choose this option, make certain you purchase full access before the courtesy period elapses. **\*\***

### **Access to UNM LEARN and UNM email**

Important class announcements and official communications will occur via UNM email. Some class material will be posted on UNM Learn. Valencia Campus provides free internet and computer access for all students at the library, STEM center, Building B (VABT), and the Learning Resource Center. Please check your email frequently.

### **Other items required for this class**

- Each student will need a non-programmable scientific calculator with logarithmic and exponential functions. Examples are the Texas Instruments (TI) 30Xa, 30XIIS, and 30XS. Casio or Sharp equivalents are acceptable, mobile telephones, graphing calculators, electronic tablets, notebooks, or laptop computers are not.
- A notebook, for notes. My lecture slides/ notes/ videos will most likely NOT be posted online. The importance of having a physical copy of your thoughts will be covered in class.
- A binder to organize printed material (handouts) from the lecture and laboratory class sessions.

### **Laboratory Sessions**

Students are not required to purchase any special equipment or supplies for this portion of the class. The laboratory sessions will involve mostly demonstrations of chemical processes to highlight the material covered in the class. Pre-lab quizzes are designed to test the students' knowledge and expectations for given chemical processes and reactions.

Students will be introduced to a laboratory environment, personal protective equipment, laboratory equipment, and analytical instrumentation. Laboratory rules of conduct and safety seminars will be given.

These sessions will also be used to allow students to work collectively and individually on their lecture assignments under the instructor's supervision. Due to the compressed schedule of summer courses, a great deal of information will be covered in a relatively short period of time and the maximum reinforcement of core concepts and skills will be necessary for student success.

### **Electronic devices**

Your textbook is electronic, and if you want to have access to the book during lecture you are encouraged to bring a mobile electronic device which can display your textbook to class. However, the *use of any electronic device for purposes other than displaying your textbook are forbidden.* **You are not allowed to record audio or video of any classroom or laboratory session without express prior written consent of all persons present.** Any student who violates this policy is subject to involuntary withdrawal from the course.

## Class Schedule

Week 1: June 5<sup>th</sup> – 8<sup>th</sup>

Read Chapter 1 and 2	Homework 1 & 2 Assigned	Pre-lab Quiz #1
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Week 2: June 12<sup>th</sup> – 15<sup>th</sup>

Read Chapter 3 and 4	Homework 3 & 4 Assigned	Pre-lab Quiz #2
		Exam #1

Week 3: June 19<sup>th</sup> – 22<sup>th</sup>

Read Chapter 5 and 6	Homework 5 & 6 Assigned	Pre-lab Quiz #3
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Week 4: June 26<sup>th</sup> – 29<sup>th</sup>

Read Chapter 7 and 8	Homework 7 & 8 Assigned	Pre-lab Quiz #4
		Exam #2 (midterm)

Week 5: July 3<sup>rd</sup> – 6<sup>th</sup>

Read Chapter 9	Homework 9 Assigned	Pre-lab Quiz #5
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Week 6: July 10<sup>th</sup> – 13<sup>th</sup>

Read Chapter 10 and 11	Homework 10 & 11 Assigned	Pre-lab Quiz #6
		Exam #3

Week 7: July 17<sup>th</sup> – 20<sup>th</sup>

Read Chapter 12 and 13	Homework 12 & 13 Assigned	Pre-lab Quiz #7
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Week 8: July 23<sup>rd</sup> – 27<sup>th</sup>

Read Chapter 14 and 5	Homework 14 & 15 Assigned	Pre-lab Quiz #8
		Final Exam

Pre-lab quizzes will be given at the end of class on Wednesdays. Quizzes will be graded and returned at the beginning of the laboratory period.

Homework will be assigned online at 4:00 AM MDT the day after lecture (Tuesday and Thursday) and is due at 11:59 MDT three (3) days later (Friday and Sunday). Late homework is accepted with a 10% reduction in value for each hour it is late.

A practice final exam will be available on UNM Learn the Friday before the final exam.

Final Grades should be posted on or before the end of business on August 4<sup>th</sup>, 2017.

## Class Policies

### Attendance

**Attendance is mandatory.** Every student is expected to attend every scheduled class and laboratory session. Absences due to illness or other emergencies must be documented after the fact or approved in advance. If circumstances allow, please email me as soon as possible and make arrangements to complete any work or readings which are necessary. Every student is responsible for completing all assignments and exams regardless of any absences. *Every excused absence must be communicated. All exams must be attended without prior exemption.*

Any student with excessive absences may be involuntarily withdrawn (dropped) from the course at the discretion of the instructor or they may receive a failing grade at the end of the semester. In addition, students will be involuntarily withdrawn by the instructor (dropped) from the course without notification for any of the following reasons:

- A. They have missed the first two lectures and the first laboratory session.
- B. They have not completed any online assignment by the end of the second week of class.
- C. They have accumulated two consecutive unexcused absences.
- D. They have accumulated a total of three absences.

**Students are expected to be on time.** Lecture and laboratory classes will begin promptly at the scheduled time. Any student who arrives more than 10 minutes late to any class session will be counted absent (it is highly recommended that you remain in class or lab anyway). Late arrival or early departure from class is disruptive and unacceptable.

### Grading

Attendance:	20%
Homework:	20%
Laboratory write-ups, quizzes	20%
Periodic Exams (3)	30%
Final Exam	10%

**\*\* The Final Exam is mandatory.** Any student who does not take the final exam will automatically fail the class\*\*

### Grades

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

## **Important Dates and Holidays**

June 9 <sup>th</sup> , 2017	Last day to change Grade Mode on LoboWeb
June 16 <sup>th</sup> , 2017	Last day to Drop class without “W” grade and receive 100% tuition refund Last day to add sections or change credit hours with form
July 4 <sup>th</sup> , 2017	University Holiday – Independence Day
July 16 <sup>th</sup> , 2017	Last Day to Drop without Dean's Permission on LoboWeb
July 28 <sup>th</sup> , 2017	Last Day to Change Grade Mode with Form Last Day to Drop with Dean's Permission with form 5 P.M.

## **Campus Policies**

### **Equal Access Services**

If you have a documented disability, psychological condition, or medical affliction which may affect your performance in class, you are required to register with the University's Equal Access Service (EAS) before accommodations can be made to assist you with your education in the classroom. EAS may be able to provide you with additional time and quiet rooms to take exams, as well as other services when there is a documented need. Additional information is available on the EAS website at: <http://www.unm.edu/~vcadvise/equalaccess.htm>

### **Academic Honesty**

Every student is expected to maintain the highest standards of honesty and integrity in all academic and professional affairs. The University reserves the right to take disciplinary action, including dismissal, against any student who is found to be responsible for academic dishonesty. Academic dishonesty includes but is not limited to: dishonesty in quizzes, tests or assignments, claiming credit for work not performed or performed by others, hindering or interfering with the academic work of others, and misrepresentation of academic or professional qualifications within or outside the University. Depending on the severity of the offense, students who commit academic dishonesty may receive a zero on an assignment, be involuntarily withdrawn from a course, or receive a failing grade in the course at the end of the semester.

### **Sexual Misconduct and Gender Discrimination**

In order to comply with Title IX requirements, all University faculty as well as teaching and graduate assistants have been designated as “responsible employees.” Any report of sexual misconduct or gender discrimination made to a responsible employee *must* be reported to the Office of Equal Opportunity and the Title IX coordinator. More information on this policy is available online at: <https://policy.unm.edu/university-policies/2000/2740.html>

## Student Learning Outcomes

Every student should be able to demonstrate all the following knowledge and skills at the termination of this course:

1. An understanding of metrology and the ability to express measurable quantities in SI (Système International d'unités) units, perform unit conversion between SI and other units, and perform quantitative calculations.
2. An understanding of the structure and composition of the atom in terms of subatomic particles. Knowledge concerning how atomic structure and composition has been determined by experimentation. The ability to diagram the structure of different atoms.
3. Knowledge of the IUPAC (International Union of Pure and Applied Chemistry) system of chemical nomenclature and types of chemical reactions. The ability to use IUPAC nomenclature to describe elemental and chemical states, express chemical reactions as balanced equations, and predict reaction products and state.
4. Knowledge of the constant of proportionality of all matter, the "mole". The ability to use the mole at the micro and macroscopic scale to perform chemical reaction stoichiometry.
5. Knowledge of gas laws and kinetic molecular theory. Use of this knowledge to relate atomic scale properties to macroscale properties.
6. An understanding of atomic electronic orbitals and the principals of electronic bonding between atoms. Utilization of atomic electronic orbital theory to predict and describe molecular electronic orbitals and orbital hybridization. Utilization of atomic electronic orbital theory to describe elemental periodic properties (electronegativity, oxidation state, etc.) and reactivity.
7. Knowledge of the different types of intermolecular forces. The ability to predict a molecule's physical properties based on intermolecular forces from its structure and composition.
8. Knowledge of the fundamentals of solubility and solution state reactions. The ability to express solute concentrations in appropriate units and explain the effects of temperature, pressure, and molecular structure on solubility.
9. The ability to express chemical reactions in terms of rate (time dependency). The ability to calculate product and reactant concentrations as a function of reaction time. The ability to determine reaction rate, rate law, and rate constant from experimental data.
10. Apply the collision model to chemical reactions including a reaction's activation energy and the effects of temperature or the presence of a catalyst on a reaction.
11. The ability to identify oxidizing and reducing molecules and reactions.

12. Knowledge concerning which environmental factors influence chemical equilibrium and an understanding of how this effects reaction rates. Knowledge of Le Chatelier's Principal and the ability to use it to predict effects on chemical equilibrium from changing reaction conditions (pressure, concentration, etc.) The ability to calculate equilibrium constants from equilibrium concentrations and vice versa. The ability to calculate an equilibrium constant and use it to determine if equilibrium has occurred in a reaction.
13. Knowledge of the different models for acids and bases and the ability to recognize commonly occurring acids and bases using molecular structure and composition.
14. The ability to calculate pH and solution concentration using equilibrium principals.
15. Knowledge of temporally unstable (radioactive) atoms and their decay modes. The ability to compare penetration and ionization power of different types of radiation, balance nuclear decay reaction equations, calculate half-life of radioactive isotopes.