

GENERAL CHEMISTRY 1411

FALL, 2008 SECTION 040 CAV200 MWF 11:00 AM -11:50 AM

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Office Hours: M-F 9 AM - 11 AM

M-F 1 PM - 2 PM

and by appointment

Textbook: Nivaldo J. Tro, *Chemistry: A Molecular Approach* (2008) [*required*]
Mastering Chemistry Student Access Kit [*optional*]

Lab Manual: David Carter, Kevin A. Boudreaux, Nick Flynn, and Joe Velasquez, III,
Laboratory Manual for Chemistry 1411 (2008) [*required*]

The ancient teachers of this science [chemistry] . . . promised impossibilities and performed nothing. The modern masters promise very little; they know that metals cannot be transmuted and that the elixir of life is a chimera. But these philosophends seem only made to dabble in dirt, and their eyes to pore over the microscope or crucible, have indeed performed miracles. They penetrate into the recesses of nature and show how she works in her hiding places.

Mary Shelley, *Frankenstein* (1818)

Course Description: In this class, you will study the fundamental laws and theories of chemistry, chemical nomenclature, chemical equilibrium, metals and non-metals and their compounds, nuclear chemistry and the quantum theory of structure. Proficiency in algebra is required.

Grading:

Exams (3)	100 pts. each*
Homework	100 pts.
Lab	100 pts.
<u>Final Exam</u>	<u>150 pts.</u>
<i>Total</i>	<i>650 pts.</i>

Grading Scale:

A	90 - 100
B	80 - 89
C	70 - 79
D	60 - 69
F	below 60

*The lowest grade among these three exams will be replaced by the optional Review Exam.

Chapter Schedule:

Chapter 1	Matter, Measurement, and Problem Solving
Chapter 2	Atoms and Elements
Chapter 3	Molecules, Compounds, and Chemical Equations
Chapter 4	Chemical Quantities and Aqueous Reactions
Chapter 5	Gases
Chapter 6	Thermochemistry
Chapter 7	The Quantum-Mechanical Model of the Atom
Chapter 8	Periodic Properties of the Elements
Chapter 9	Chemical Bonding I: Lewis Theory
Chapter 10	Chemical Bonding II: Molecular Shapes, VB Theory, and MO Theory
Chapter 11	Liquids, Solids, and Intermolecular Forces

Student Learning Outcomes:

To gain knowledge about the terminology and language of chemistry.

To learn to interpret and reason using basic chemical concepts, law, and theories.

Mathematical relationships will be introduced and will be used to solve problems.

By the end of the semester the student should be able to:

- Use the periodic table as a tool to solve problems.
- Understand the role of the atomic concept in chemistry.
- Be able to understand how to set up and solve standard chemical calculations based on chemical formulas and balanced chemical equations.
- Understand concepts of chemical bonding.
- Understand the importance of molecular geometry in determining chemical properties and reactivity.
- Understand the role of energy in chemical reactions.
- Understand the properties of solutions of chemicals.
- Perform calculations related to thermochemistry and gas laws.

Attendance: Class roll will be taken regularly, and the attendance policy described in the 2007-2009 Undergraduate-Graduate catalog will be followed. Make-ups for exams or quizzes which have been missed for valid reasons must be taken *no later than one week following the absence*. Makeup exams will not be multiple choice. No makeup assignments will be given unless a valid excuse is furnished. If you miss a class, it is your responsibility to find out what you missed.

Lab Course: The CHEM 1411 General Chemistry laboratory class accompanies this lecture class. The lab is designed to illustrate some of the principles involved in performing scientific measurements, handling chemicals, and performing chemistry experiments. In some cases, the experiments in the lab will introduce you to concepts *before* you cover them in the lecture course, and in some cases, the experiments will reinforce concepts already covered in the lecture course.

The grade you receive in lab will be counted as a 100 pt. score, and may not be replaced with the Review Exam score.

There will be a number on online assignments that must be completed for each lab, using the Maple TA software. Some of these assignments must be completed before coming to lab, and some will be due after the lab is completed. The use of this software will be demonstrated during the first week of classes.

Labs will begin meeting during the first week of classes. Bring your calculator!

Proper attire (long sleeves, long pants, closed-toe shoes, and lab goggles) will be required in your laboratory section!

Reserve Material: Most of the slides which are projected on the LCD projector are available on my faculty web page at www.angelo.edu/faculty/kboudrea. (There is also a link to this page from the "Our Faculty" section of the Department of Chemistry and Biochemistry web page at www.angelo.edu/dept/chemistry/.) Homework and exam schedules, suggested problems, and study guides will also be posted here.

Most of the files will be in PDF format, which can be read using the free Adobe Acrobat reader (www.adobe.com). If you have trouble accessing these files, or you want the printout in some other page format, I can make a copy on a removable drive or blank CD-R.

The printed lecture notes do *not* contain all of the information presented during the class, such as solutions to the example problems. You should take good notes anyway.

Quizzes: Quizzes will be given *every week*, usually at the end of class on Fridays. They will be based on material presented since the previous quiz, and will be taken primarily from the problems in the textbook. There will be approximately 12 to 15 quizzes, worth 100 points each; the lowest two quiz grades will be dropped from the total; and the remaining quiz grades will be averaged together, with the computer homework scores, to make a 100 point grade.

Exams: Three hour-long exams, each worth 100 pts., will be given on **September 19, October 24, and November 21**. The problems from the textbook and the homework will be a good preparation for these exams.

Exams cannot be made up, except in the case of school-related functions (prior notification required), serious illness (note from a doctor, etc., required), or a death in the family.

If classes are cancelled on the day an exam is scheduled, assume that it will be given on the next class day.

Review Exam: On **Tuesday, December 2**, at about 2 PM, an optional, comprehensive Review Exam will be given. The score on this exam will replace the lowest of your three exam grades. (The lab grade *will not be replaced*.) If the grade on the Review Exam is lower than the lowest exam score, it will not be counted. Although this exam is strictly optional, it will be good practice for the final exam.

If you cannot take the exam at the scheduled time, it will be possible to take it at some other time that Tuesday or on Wednesday, provided that you take it before Wednesday evening.

Final Exam: The comprehensive (but not, I hope, incomprehensible) Final Exam will be on **Wednesday, December 10 from 10:30 AM to 12:30 PM**. Half of the exam will be taken in part, but not totally, from the previous exams, suggested problem sets, and quizzes. The other half will be a standardized, multiple-choice American Chemical Society (ACS) exam. **Students who must miss the scheduled exam time must notify the instructor by noon of the day of the exam, otherwise no make-up provisions will be made.**

Withdrawal from the course: Anyone dropping this class by **Thursday, October 30**, will receive a grade of W. **No drops are allowed after this date.** If you need to drop the class, it is your responsibility to obtain the instructor's signature on any drop slip prior to that date.

Review Sessions: Review sessions will be held weekly on Wednesdays at 5 pm (location to be announced later). During these sessions, I will work problems from the book, review concepts presented in the lecture, go over problems from the homework, or anything else that you may have questions about. These sessions should give you a chance to enhance your understanding of chemistry, and hence, your grade.

Tutoring sessions will be conducted by the local student affiliate section of the American Chemical Society (ACS). The time and location of these session will be announced later.

Studying and Homework: The lectures will follow the general format for the textbook; it is expected that you will read the appropriate sections in the textbook. In general, for any college-level class, you should be prepared to spend about 2-3 hours of studying for each hour of lecture.

In order to master chemistry, you **MUST WORK PROBLEMS**. This textbook has a good selection of problems within each chapter and at the end of each chapter. You should make an effort to work all of the problems within the text of the chapter; in addition, I will highlight some

selected problems from the end of the chapter that you should try to work. You can expect to see a lot of these (or at least similar ones) on the exams.

Copies of the *Student Solutions Manual* will be on reserve in the library; in this book, all of the problems which have answers in the back of the textbook are worked out in full.

Textbook Web Site: The web site for this textbook is wps.prenhall.com/esm_tro_chemistry_1/. This site has a large number of activities, problems, and movie clips that reinforce many of the concepts presented in the class.

Academic Honesty: Angelo State University expects its students to maintain complete honesty and integrity in their academic pursuits. Students are responsible for understanding the Academic Honor Code, which is contained in both print and web versions of the Student Handbook. Students are expected to work independently on homework assignment, quizzes, and exams. Cheating and/or plagiarism will not be tolerated.

Students with Disabilities: Persons with disabilities which may warrant academic accommodations must contact the Student Life Office, Room 112 University Center, in order to request such accommodations. You are encouraged to make this request early in the semester so that appropriate arrangements can be made.

Optional Computer Assignments: *Mastering General Chemistry* (MGC) is an online homework program that accompanies this textbook. Assignments which have tutorial feedback will be made available for students who wish to use them for additional practice, but these assignments will not be graded.

The Access Kit that accompanies the textbook gives you instructions on how to set up an account with the MGC system. If anyone is interesting in using MGC, I will assist you in setting up an account and logging on to the system.

NOTES:

1. College classes are significantly more challenging than most high school classes. To get the most out of this class, you should study at least 2-3 hours for each hour of lecture.
2. Working problems is necessary for doing well in this class. Working a few problems of several different types each day is better than doing a whole problem set in one day and then not working on it for several days. It is not assumed that you have a prior background in chemistry, but if you do, that will be an advantage. If you do not have a strong chemistry background, you will need to work more than the assigned problems to get the necessary practice.
3. "Cramming" for exams is ineffective in the long run, since material that is learned in this way is easily forgotten. Those of you who will be taking other sciences classes, or are pre-med majors, will see a lot of this same material in organic chemistry, biochemistry, any future labs, the MCAT, etc. You should set aside regular times for studying for this course. Include some old material in each study session, since the material in chemistry is to a large extent interconnected and cumulative.
4. Pay attention to vocabulary. Many words have very precise meaning in science that have broader meanings in the English language. Many chemical names look or sound similar, but represent significantly different substances.
5. You must learn to solve complex scientific problems to be successful as a science or pre-med major. Good problem solving skills are learned slowly and require lots of practice. Seeing other work problems or working in groups to solve problems can greatly facilitate that process. Some suggestions for working in groups include working at a blackboard, and talking the problem through out loud.