General Chemistry (Honors)  
CHEM 1305  
Fall Semester 2015 Syllabus

Instructor

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Course Description and Prerequisites

This is the first half of General Chemistry, an introduction to the fundamentals of chemistry for scientists, engineers and pre-professional students. Mathematics 1508 (pre-calculus) is prerequisite for this course but may be taken concurrently with CHEM 1305. The laboratory, CHEM 1105, is a co-requisite for everyone except some engineering majors. Workshop is an essential component of CHEM 1305. Co-enrollment in CHEM 1305 (Honors) Workshop is required.

Required Material:


Curriculum

The primary content of CHEM 1305 is the material contained in Chapters 1-10 of Chang. CHEM 1305 is rigorous and demanding and should not be attempted without adequate mathematical preparation. This semester we will cover chapters in the following sequence:

1. Chemistry: the study of change  
2. Atoms, Molecules and Ions  
4. Reactions in Aqueous Solution  
5. Gases  
6. Thermochemistry  
7. Quantum Theory and the Electronic structure of Atoms  
8. Periodic Relationships Among the Elements  
9. Chemical Bonding I: Basic Concepts  
10. Chemical Bonding II: Molecular Geometry and Hybridization of Atomic Orbitals

The CHEM 1305 Workshop will require students to:

- Practice asking (and answering) meaningful questions (of the why? and how?) nature  
- Learn how to work successfully in teams to solve challenging chemical problems  
- Learn how to argue persuasively but respectfully about chemical concepts
• Practice oral report out to the entire Workshop, thus gaining confidence in public speaking.

**Lecture Schedule** Listed below are the lecture dates along with the approximate lecture material for that date. Also shown are the tentative examination dates.

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This schedule is subject to revision.

**Expectations for this Course:**

• Every student will be mentally engaged in every lecture and every Workshop session.
• Before class each day every student should:
  • Read the appropriate pages in the textbook.
  • Practice, practice, practice answering questions and appropriate problems from the text such as the worked Examples in the text, the Practice Exercises after the Examples, End-of-chapter Questions and Problems, and Study Questions.
  • Students will attend extra sessions and/or office hours given by Peer Leaders and Hour Examinations.

**Hour Examinations.** Exam 1, 2 and 3 will be one-hour examinations taken during regular class time. All of the exams will be comprehensive, that is, they may contain questions from all of the material covered prior to the exam. For the in class exams no cell phones, beepers, or other electronic devices may be on or used during examinations inside or outside the examination room. Any student found using an electronic device other than a calculator during an examination will receive a grade of zero on the examination. No caps or hats may be worn during examinations. Bring a photo identification card to all examinations to display when turning in your examination. You may use only a non-programmable calculator (i.e. a calculator not capable of retaining equations or words) during the hour examinations and the final examination. A satisfactory calculator (which can perform logarithmic and exponential operations needed for CHEM 1305) can be purchased for less that $15. If you cannot afford to purchase one, then borrow one or see your instructor.
CHEM 1305 examination questions are designed to test: i) understanding of basic concepts and ii) familiarity with chemical nomenclature, usage and calculations. Examinations emphasize problem solving as opposed to memorization. You are well advised to learn the process involved in problem solving rather than memorization of specific facts. The dates for examinations shown above in the class schedule are subject to change. Valid absences for University related activities (e.g. out-of-town research presentations, sporting events) must be arranged with the instructor prior to the date of the respective examination. No provision exists for make-up of examinations missed as a result of unexcused absences; students will receive a grade of zero for missed examinations.

**Workshop:** Workshop is a required component of CHEM 1305. Students enrolled in the honors CHEM 1305 Lecture section also must be co-enrolled in the correspond honors Workshop section; no exceptions. **Workshop is NOT the same as CHEM 1105 Laboratory.** Each Workshop meets for a two-hour period, is overseen by a Peer Leader, and has a grading policy based on participation and involvement. Approximately 20% of the course grade is represented by participation in Workshop, but Workshop is required to pass CHEM 1305. Absence, tardiness, or leaving early from Workshop results in a grade reduction in the overall CHEM 1305 grade. The Workshop format allows the Peer Leaders to use active learning techniques to enhance understanding of chemical principles, to provide hands-on exposure to qualitative, descriptive chemistry activities (Explorations), and to give practice with problem solving methods. Goggles (you must provide them and bring them to Workshop each week) must be worn during chemical Explorations (laboratory exercises).

**Study Questions:** Study questions pertaining to the material covered in class will be emailed to the students. Subsequently, the answers to these study questions will be emailed to the students. Questions on the examinations will be similar to those included in the sets of study questions.

**Peer Leader:** The workshop peer leader assigned to our course will attend each lecture so you can get to know him. Discuss problems, questions, concerns with our PL. Our PL will also conduct review sessions prior to the Final Examination.

**Final Examination:** By University edict, everyone taking this CHEM 1305 course must take the final examination at the time specified, Tuesday, Dec. 8, 2015 at 7:00 a.m., no exceptions. You may use only a non-programmable calculator during this examination. The examination consists of the standardized American Chemical Society first semester general chemistry examination. The questions are multiple-choice. This examination covers the entire curriculum for the first semester course.

**NO CELL PHONES, BEEPERS, IPODS, CD MACHINES OR ANY OTHER ELECTRONIC DEVICES MAY BE ON OR USED DURING THE HOUR, OR FINAL EXAMINATIONS INSIDE OR OUTSIDE OF THE EXAMINATION ROOM.**

Any student found using an electronic device during the final examination will receive a grade of zero on the examination. No caps or hats may be worn during the hour or final examinations. Bring a photo identification card to display in order to turn in your examination. You may not use a programmable calculator (i.e. a calculator capable of retaining equations or words) during any examination. Anyone found using a programmable calculator will receive a grade of zero. You can purchase a satisfactory calculator which can perform logarithmic and exponential operations (needed for CHEM 1306) for less that $15 at many stores. If you can not afford to purchase one, then borrow one.
Study Objectives
Take the time to read the Preface to your textbook. The Chang text comes with a wealth of WEB-based learning materials and problem solving tools. Take advantage of them; find out what works best for you. **You need to prepare yourself for answering any problem of a given type, not just problems you have seen before.** The key to mastering chemistry is not the accumulation of many facts (i.e. memorization), but the integration of chemical concepts into an understanding of the subject. Spend time thinking about **why and how** something works the way it does, rather than what is the name, number, i.e. factoids to memorize. Form cooperative, active study groups with 2-3 other students, perhaps some of your fellow students from your Workshop section.

Homework assignments, Quizzes, and Study Recommendations may be given as a component of the Workshop sections of the course. You are strongly urged to work most of the problems at the end of each chapter. Within the text the author delineates worked **Examples** and **Exercise** questions, some answered, some not. Generally speaking, the more problems you can solve without referring to a worked solution or the text, the better your understanding of the material. Important terms appear in **bold font** in the text and are listed alphabetically in the Index/Glossary. Building a scientific vocabulary is largely memory work. You should feel free to ask your lecturer and Peer Leader about specific terms that you do not understand. The textbook gives a clear presentation of the major concepts and of the procedures used for problem solving. You are encouraged to ask questions of your lecturer and Workshop peer leaders both during class and tutorial hours and to fully utilize the tutorial services on campus, e.g. the ACES Centers. Many students have found these services to be very helpful. You are not alone in the pursuit of chemical understanding.

**Grades (subject to revision):** Letter grades for the CHEM 1306 course are assigned on the basis of your total score earned for the semester. The tentative grading scheme is based on the following calculation: A) **Final** examination (comprehensive) score (25%), B) **Workshop** (20%), and C) **Hour Examinations** (55%). The exact cut-off scores for each letter grade in CHEM 1305 will be determined at the end of the semester, but a **rough** guide is something like 70%, 80%, and 90% for grades of C, B, and A. **(This grading scheme is subject to revision during the semester.)**

**Course Withdrawal Policy** “Classes dropped prior to the official **census date** of any term (this term: September 10, 2014) will be deleted from the student’s semester record.” After this date, the University permits any student to drop with an automatic “W” until Friday, October 31, 2014. **After** October 31, 2014, students who withdraw must receive grades of **F**.

**Student Major:** The CHEM 1305 - 1306 sequence is designed for students who are majoring in a field of science or engineering.

**Laboratories:** CHEM 1105 is a separate course from CHEM 1305. Workshop is an integral part of CHEM 1305. The content for CHEM 1105 laboratory will be integrated with the material covered in lectures and Workshop in CHEM 1306. The laboratory is highly recommended for all students regardless of major.

**Disability:** If you have or suspect a disability and need accommodations you should contact the Center for Accommodations Student Services Office (CASS) at 747-5148 or at cass@utep.edu or come by Room 106 Union East Building.

**Secretarial Services:** The office of the general chemistry secretary, Lucema Armenta, is now located in the new Chemistry and Computer Science Building. A bulletin board placed outside of the secretary’s office contains all
necessary information regarding exams, solutions to problems, etc. It is to your advantage to check the board frequently for information. Office hours are from 8:00 am to 12 noon and the 1:00 PM - 5:00 PM; the office is closed for lunch (12 noon - 1:00 PM) and the secretary is unavailable during this lunch hour period.

**GOGGLES.** You will need to bring your own goggles to your CHEM 1305 Workshop each session. The Student Members of the American Chemical Society sell goggles. State law requires that goggles be worn if a student is working in laboratory for this class. Ask your peer leader about this if you are interested in purchasing goggles.

**ACADEMIC HONESTY.** Students are expected to do their own work on exams. Any form of cheating, including the use of crib notes, copying from a neighbor, etc. will be reported to the Dean of Students. This will put your grades on hold until a ruling is made. If sufficient doubt exists whether an exam copy represents your own work, you may be required to take a special exam to verify it. Familiarize yourself with the university policies on cheating, plagiarism and academic conduct.