General Chemistry
CHEM 1305
Fall Semester 2023
11358
Syllabus

Instructor

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Office Hours

MMF 10:00 to 11:00

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.

Required Material

First Semester General Chemistry Exploration Fall - 2023, ISBN 978-1-943668-33-8. This Workbook is required. There are two choices for purchasing the workbook. One is the UTEP Bookstore (for something like $129.50 plus tax). The other is online at PLTLbooks.org, for a lower price.

Optional Course Material

Optional Textbook: Chemistry, by Raymond Chang, 10th Edition, McGraw-Hill Science. Any newer or any older edition of this textbook may also be used for studying for this course. It is the student’s complete responsibility to resolve any content differences among the editions. Used copies of this excellent text can be found on-line for prices below $20, depending on availability.
Curriculum

The primary content of CHEM 1305 is the material contained workbook and 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 study the subjects 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

Lecture Schedule Listed below are the lecture dates along with the subject 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 should 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 should attend extra sessions and/or office hours given by Peer Leaders.

Hour Examinations: Exam 1, 2, 3 and 4 will be multiple choice exams. Except for exam 1 all exams will cover the material that was covered in the class sessions since the previous exam.

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. 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. 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: Discuss problems, questions, concerns with your peer leader. Peer leaders will also conduct review sessions prior to the examination.

Final Examination: The final exam will also be a multiple choice exam, which will be available on December 12.
**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 1305 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 (20%), **B)** Workshop (20%), and **C)** Hour Examinations (60 %). 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 8, 2021) 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 29, 2021. After October 29, 2021, a students may not drop except under circumstances in which there is a complete withdrawal from all courses for medical or nonmedical reasons.

**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 1305. 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.
**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.