Course Description:

Chemistry is an experimental science. Chemical knowledge has resulted from experimental observations and studies made by thousands of scientists over many centuries. In the chemistry laboratory, students will examine, test, and establish for themselves the chemical principles studied in class and from textbooks; will collect experimental data; and will use their reasoning to draw logical conclusions about the meaning of these data.

Prerequisite: General Chemistry I (CHEM 1312) & General Chemistry I Lab (CHEM 1111), and credit for or concurrent enrollment in General Chemistry II (CHEM 1311).
Student Learning Outcomes (Core Objective Assessed):

- Students will demonstrate the ability to make scientific predictions of natural phenomena using chemical concepts learned in the lab. (Critical Thinking Skills)
- Students will develop skills in collecting and managing data in order to express their results in a precise and reliable quantitative or qualitative form on lab reports. (Empirical and Quantitative Skills, Communication Skills)
- Students will apply chemical concepts to draw logical conclusions about the applicability of data to real-world problems. (Critical Thinking Skills)
- Students will use collected data to calculate physical or chemical quantities germane to the experiment being performed. (Empirical and Quantitative Skills)
- Students will develop teamwork skills that include not only the efficient acquisition of experimental data, but also the awareness of safety in the laboratory setting. (Teamwork)

In addition to the core objectives being assessed students will also be expected to

- Use basic apparatus and apply experimental methodologies in the chemistry laboratory setting
- Demonstrate safe and proper handling of laboratory equipment and chemicals

Materials Required for Lab Work:

**Laboratory Notebook:** Each student must purchase and maintain a bound laboratory notebook in which to generate a permanent record of experimental observations, notes, calculations, etc. The lab record book you purchase must provide:

- a label for your name and contact information (phone, email, or other), course prefix (CHEM), course and section number (e.g., 1112.006), semester, and the instructor’s name;
- a table of contents page
- pages consecutively pre-numbered;
- preprinted page headings for entering title, date, name, and specific lab section (e.g., CHEM 1112.006); and
- a perforated, carbonless duplicate for each page.

**Lab Manual:** CHEM 1112 General Chemistry II Laboratory Manual, Department of Chemistry, The University of Texas at Tyler, Tyler, Texas, 2014.

**Scientific Calculator**

**General Chemistry Lecture Textbook:** This item may not be essential during class, but may be needed for reference purposes to complete laboratory assignments.

**Computer Access:** with Microsoft Excel, PowerPoint, Word, and LoggerPro (free for students through course).

**Splash-proof Safety Goggles:** Goggles must be worn in the laboratory whenever you or your neighbors are performing experiments. (Time during your initial lab period will be allotted for purchasing goggles from your American Chemical Society Student Affiliates on campus to ensure that you will be prepared to comply with this requirement.) **Warning:** students will not be admitted into the lab without splash-proof goggles!

Lab aprons will be made available by the department for student use, but students must also plan ahead to be clothed appropriately for laboratory work. **Warning:** students will not be allowed to work in the lab without an effective coverage from chest to toes! **(This means no open-toed shoes or extensive areas of exposed skin on your torso!)** If you do not meet these requirements, you cannot work in the lab until the requirements are met.
Laboratory Requirements:

A. Students who perform unauthorized experiments or who remove chemicals or equipment from the lab may be dropped from the course or have their grades lowered.

B. Arrive on time and be prepared for each laboratory session. The laboratory experiments are such that the average student can complete the work during the assigned time. This can be accomplished only if a reasonable amount of study and preparation has been done before coming to the laboratory. Plan what is to be done in each experiment before coming to the lab. It will save time and will aid in avoiding serious mistakes.

C. Students are responsible for laboratory equipment furnished by the Department of Chemistry and students may be required to purchase any missing or damaged equipment.

D. The grading of experiments will be based on the evaluations of each student’s laboratory performance, experimental results, and the quality of their laboratory reports (i.e., analyses and presentations of results.)

E. Students will be responsible for maintaining cleanliness in the desk areas. In addition, several students will be assigned clean-up responsibilities during each lab session that include shelves, sinks, hoods, and reagent table. Students who neglect their clean-up responsibility will have their grades significantly lowered for that day’s work. Therefore, it is important that students assigned to clean-up have their work approved by the lab instructor before leaving lab.

F. Students are required to turn in a lab report for each experiment. Your instructor will explain what is expected in the lab reports.

G. Each instructor will provide an addendum to this syllabus listing specific requirements for that section.

Chlorine is a deadly poison gas employed on European battlefields in World War I. Sodium is a corrosive metal which burns upon contact with water. Together they make a placid and unpoisonous material, table salt. Why each of these substances has the properties it does is a subject called chemistry.

—Carl Sagan

In 'Can We Know the Universe? Reflections on a Grain of Salt,' in John Carey, Eyewitness to Science (1997), 437.

Safety Policy

Read, comprehend, and follow the laboratory safety guidelines at all times. These rules include, but are not limited to:

Safety goggles must be worn in the laboratory at all times. Students who do not have safety goggles will not be admitted into the laboratory.

You will not be allowed in the lab with open-toed shoes or any clothing exposing extensive areas of your skin to the risks of burns or chemical splashes. Please come to class each day wearing long pants or skirt, an appropriate shirt and closed toe shoes. There is not sufficient time for you to return home to change clothes and we have NO opportunity to make-up missed labs.

Do not consume anything by mouth in the lab, including gum and smokeless tobacco! There is no eating in the lab space.

Do not perform unauthorized experiments or remove chemicals or equipment.

Note: we take safety infractions very seriously. Depending on the seriousness of such infractions, you may lose points on your lab work habits grade, be dismissed and receive a zero on any work missed, or even be dropped from the course.

Attendance Policy

Lab attendance is essential. One make up lab is allowed (for one excused absence only).

An unexcused absence results in a grade of zero for any lab work or exam missed.

Normally, an excused absence includes medical emergencies, a death in your family or required travel for a UT Tyler’s event (e.g., athletic team travel). All supporting documentation should be presented to the lab instructor.

Students who anticipate being absent from class due to a religious observance are required to inform their instructors of such absences as soon as possible (at least one week before the religious holiday).

Students who anticipate being absent from class due to a required travel for a UT Tyler’s event (e.g., athletic team travel) are required to inform their instructor(s) of such absences at least one week before the absence.
Course Grading

The grading of the lab reports, quizzes, and exams are up to your instructor; however the weighting of these items will be uniform across all lab sections (see below). Your overall course grade will tentatively be based on the 90/80/70/60 percentage scale, but it may be adjusted based upon your instructor’s judgment of the overall class performance.

**Examinations:**
There will be 2 examinations. The topics for Exam 1 and Exam 2 are listed in the manual after Experiments 4 and 8, respectively. The first examination will cover the first 4 experiments. The second exam will only cover the last 4 experiments, however, any concepts or types of calculations from the first 4 experiments that are used in the last 4 experiments are fair game (e.g. calculating means and standard deviations). The amount of time allotted for each exam will be specified by your instructor.

**Lab Reports:**
For the first four experiments we will be focusing on how to properly keep a lab notebook. You will write all pre-lab materials, data and observations collected during the experiments, and any post lab calculations, conclusions and questions in your notebook. You will turn in the copy pages from your notebook, along with any graphs you may have made during the experiment at the end of the class the same day. For the last four experiments we will begin to learn how to format a proper lab report. You will still write all pre-lab materials as well as data and observations collected during the experiments and calculations required in your lab notebook. For these four experiments you will be required to present some of your data/results (specified by your instructor) in a table you create using

The grades for this course will be weighted as follows:
- 15% Pre-Lab Quizzes
- 35% Examinations (2)
- 50% Laboratory Reports
- 100% Total

**Pre-Lab Quizzes:**
Pre-lab quizzes will be given before each lab to encourage you to be prepared for class. Hints for the items to study for each quiz are given for each experiment in the manual.

**Dropping the Course:**
The last day to withdraw from the course with an automatic grade of “W” is listed on the laboratory schedule (see next page). Before dropping the course, you should consult with your instructor to examine all of your options. Dropping this course does not obligate you to also drop the lecture course because they are two separate courses. However, dropping the lecture course may significantly hinder your progress in this course because you will be expected to learn the chemical theories and concepts on your own.

**University Policies:**
To see a list of the general University policies please follow this link: [www.uttyler.edu/academicaffairs/syllabuspolicies.pdf](http://www.uttyler.edu/academicaffairs/syllabuspolicies.pdf)

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: [www2.uttyler.edu/wellness/rightsresponisibilities.php](http://www2.uttyler.edu/wellness/rightsresponisibilities.php)
Week Of:  Experiment Schedule and Lab Report Due Dates

Jan 14  Introduction to course, lab safety, complete Canvas safety assignment

Jan 21  Martin Luther King Jr. Day—Labs will not meet this week

Jan 28  Lab: *Exploring the Properties of Gases*

Feb 4   Lab: *Crystalline Lattice Structures*

Feb 11  Lab: *Synthesis of Alum*

Feb 18  Lab: *Spectrophotometric Determinations of Food Dyes*

Feb 25  Laboratory Examination 1

Mar 4   Lab: *Determining Molar Mass by Freezing Point Depression*

Mar 11  Spring Break—Labs will not meet this week

Mar 18  Lab: *Determining Reaction Rate by the Initial Rate Method*

Mar 25  Lab: *Determining the Acid Dissociation Constant of a Weak Acid*

Apr 1   ACS Convention—Labs will not meet this week
        Last day (April 1st) to drop or withdraw from a course with an grade of “W”

Apr 8   Lab: *Review of Molecular Geometry and Bonding*

Apr 15  Laboratory Examination 2
        Last time labs will meet
        Due: Make-Up Experiment

Note: the right to substitute or switch labs, as required by unforeseen circumstances, is reserved. All lab procedures are provided in your lab manual.