



**Syllabus:** General Chemistry II  
**Course Number:** Chemistry 1412  
**Semester & Year:** master

**Instructors Information:**

Staci Thomas, Instructor  
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Office Hours: M-F 7:30-7:50am, 3:40-4:10pm (by appointment), 10:25-11:55am "B" days  
Google Classroom code: **mifkuko**

**Course Description:** Chemistry 1411 covers the fundamental principles of theoretical and applied chemistry. Topics of study include acid-based theory, kinetics, equilibrium, thermochemistry, electrochemistry, nuclear chemistry, qualitative analysis, and introduction to organic and biochemistry. Prerequisite: CHEM 1411 or the permission of the instructor. Chemistry 1412 involves lecture sessions and laboratory sessions. Students who enroll in Chemistry 1412 enroll in a lecture section and a laboratory section.

**Prerequisites:** Students are expected to have completed either pre-calculus in high school or college algebra. Those that do not meet these requirements should be concurrently enrolled in Chemical Calculations (Chemistry 1205). It is helpful to have had one or more years of high school chemistry or an introductory course in college chemistry, and must have also taken CHEM 1411. Students who cannot meet these requirements need the permission of the professor to enroll.

**Dual Credit:** The Dual Credit program at Texarkana College allows high school students to earn high school and college credits simultaneously. Through dual credit agreements, the college and the public school districts have selected courses that meet both high school and college learning objectives. Dual Credit Agreements must be annually updated, approved and signed by both required parties before students are allowed to enroll in dual credit courses. These courses are offered at local high schools and as online classes. Students interested in participating in this program must meet Texas Success Initiative assessment requirements appropriate for each course. To enroll in these classes, students must complete TC's admission requirements

**Required Textbooks:** A textbook will be used in this class as a resource in addition to the lessons covered during class time. I will not assign reading passages from the text or require problems from the text (although some problems will be suggested for practice). As a student taking a college-level course, you are responsible to use any resources available to you in order to master concepts. Suggested textbooks for Chemistry 1412 are Chemistry, 4<sup>th</sup> edition by McMurry and Fay (ISBN 0-13-140208-0) and *Chemistry*, available through openstax (ISBN 978-1-938168-39-0). The openstax resource can be found at <https://openstaxcollege.org/textbooks/chemistry> and can also be accessed through the Google Classroom page for this course. Other helpful resources will be placed on Google Classroom for each unit covered.

**Homework:** The purpose of homework is to practice using the information learned in class and will be assigned occasionally. Due dates for the assignments are flexible because the homework is meant to assess progress toward mastery of a topic. Please try to submit the assignments before the exam so that you may receive adequate feedback. Waiting until the last minute, or not taking the homework seriously defeats the purpose of practicing a concept.

### Course Overview

Topic	Tentative Dates Covered	Chapter in Textbook (McMurry Fay/openstax)	Homework Assignments	Laboratory Activity
Solutions	TBA		•	<ul style="list-style-type: none"> <li>Concentration and Absorbance</li> <li>Colligative Properties</li> </ul>
Acids and Bases			•	<ul style="list-style-type: none"> <li>Titration of an Acid with a Base</li> <li>Ka of a Weak Acid</li> </ul>
Chemical Kinetics			•	<ul style="list-style-type: none"> <li>Rate of Decolorization</li> </ul>
Chemical Equilibrium			•	<ul style="list-style-type: none"> <li>LeChatelier's Principle</li> </ul>
Thermodynamics			•	<ul style="list-style-type: none"> <li>Heats of Fusion/Vaporization</li> <li>Heat of a Reaction: Hess's Law</li> </ul>
Electrochemistry			•	<ul style="list-style-type: none"> <li>Oxidation of a Metal</li> </ul>
Nuclear Chemistry			•	<ul style="list-style-type: none"> <li>Model of Radioactivity</li> </ul>
Organic Chemistry			•	

### Tentative Examination Schedule:

Examination I	Solutions	TBA
Examination II	Acids and Bases	
Examination III	Chemical Kinetics	
Examination IV	Chemical Equilibrium	
Examination V	Thermodynamics	
Examination VI	Electrochemistry	
Examination VII	Nuclear Chemistry	

**Laboratory:** Because of the nature of dual credit courses, the laboratory portion of the course will be delivered in conjunction with the lecture portion of the course. Labs are scheduled so

that what is investigated in the lab coincides with the content covered in lecture. Chemistry 1412 laboratory introduces the student to basic chemistry laboratory concepts, techniques, and calculations. Safety practices are covered during the first laboratory, and the safety theme is continued throughout the semester. Students are required to wear safety glasses at all times, wear pants that cover the legs, and have closed toed shoes. Each student will sign a safety agreement stating that if basic safety rules are not followed, the student will not be able to participate in the lab. Students will write a laboratory report for each lab activity. It is highly recommended to write all reports in a composition notebook. Lab reports will include most (if applicable) of the following: title or investigated question, purpose, identification of variables, hypothesis, procedure or methods, data, sample calculations, conclusions, and applications or post-lab practice. If a student misses a laboratory activity, he or she will need to reschedule a time to make up the lab (see office hours) or receive a grade of zero for the lab. Alternate assignments will not be available for missed labs because the experience of doing the lab work is critical to the objective of each lab. A rubric will be used to assess the overall grade for the laboratory notebook.

**Final Course Grade:** The final course grade is determined by combining the lecture, laboratory and homework grade together in the following manner:

Grade Category	Maximum Score
Topic Examination (7 @ 100 points each)	700
Final Exam	200
Laboratory Notebook	200
Homework average	100
Total Score	1200

Total Points	Course Grade
1080 - 1200	A
960 - 1079	B
840 - 959	C
720 - 839	D
< 720	F

**Tutoring:** Texarkana College Student Support Services has tutors available to assist chemistry students that need help with the course. They can help with the completion of homework assignments and laboratory assignments. These tutors are typically available in the Chemistry Building. Schedules will be posted.

**Learning Outcomes:** The learning outcomes for Chemistry 1412 are published by the Texas Higher Education Coordinating Board and are available from the Lower-Division Academic Course Guide Manual. The following are included for those that successfully complete the course:

1. State the characteristics of liquids and solids, including phase diagrams and spectrometry
2. Articulate the importance of intermolecular interactions and predict trends in physical properties.

3. Identify the characteristics of acids, bases, and salts, and solve problems based on their quantitative relationships.
4. Identify and balance oxidation-reduction equations, and solve redox titration problems.
5. Determine the rate of a reaction and its dependence on concentration, time, and temperature.
6. Apply the principles of equilibrium to aqueous systems using LeChatelier's Principle to predict the effects of concentration, pressure, and temperature changes on equilibrium mixtures.
7. Analyze and perform calculations with the thermodynamic functions, enthalpy, entropy, and free energy.
8. Discuss the construction and operation of galvanic and electrolytic electrochemical cells, and determine standard and non-standard cell potentials.
9. Define nuclear decay processes.
10. Describe basic principles of organic chemistry and descriptive inorganic chemistry

Specific laboratory objectives required by the Texas Higher Education Coordinating Board and available from the Lower-Division Academic Course Guide Manual are:

1. Use basic apparatus and apply experimental methodologies used in the chemistry laboratory.
2. Demonstrate safe and proper handling of laboratory equipment and chemicals.
3. Conduct basic laboratory experiments with proper laboratory techniques.
4. Make careful and accurate experimental observations.
5. Relate physical observations and measurements to theoretical principles.
6. Interpret laboratory results and experimental data, and reach logical conclusions.
7. Record experimental work completely and accurately in laboratory notebooks and communicate experimental results clearly in written reports.
8. Design fundamental experiments involving principles of chemistry.
9. Identify appropriate sources of information for conducting laboratory experiments involving principles of chemistry.

### **GENERAL COURSE POLICIES**

**Attendance Policy:** You are not required to attend lecture sessions. Success in college level courses is often closely correlated with classroom attendance and participation. The role will be called and a list of those absent maintained. If you make a grade of "F" for whatever reason the last day you attended class based on the class role will be recorded on the final grade sheet. This may impact your scholarships and future funding. It is possible that you will be asked to return money based on this date. Attendance and completion of laboratory assignments is mandatory. Students who miss more than three laboratories will be dropped from the class unless other arrangements are made with the laboratory instructor. Students who do not achieve a score of "D" or better for the laboratory portion will not receive a passing grade in Chemistry 1411.

**Classroom Behavior:** In general, lectures and laboratories are conducted in a rather open fashion with adequate opportunity for students to interact with their instructors and with each other about chemistry. Excessive talking between students or other behavior that becomes a distraction to the instructor or class members will result in the student(s) being asked to leave the class. Please mute any electronic devices before attending course lectures. General behavior for students on campus is reviewed in the Texarkana College Catalogue and the Texarkana College-Student Handbook (<https://www.texarkanacollege.edu/>)

**Missed Examinations:** If you know in advance that you are going to miss an examination it is best to arrange with the instructor to take the examination early. If you miss an examination for reasons beyond your control, you should contact the instructor as soon after as feasible to make arrangements to take the examination. Examinations are typically graded promptly and returned. It is best to take a missed examination prior to the original being returned to the class for review. In cases of extended illness or disaster, accommodations can usually be made.

**Missed Laboratory:** Students who know they will miss laboratory should meet with the instructor to see if attending a laboratory on a different day of the week is feasible. Instructors are generally willing to help students who notify them promptly of their attendance problems and keep them up to date. Students who miss more than three laboratory sessions will be dropped from the course unless they have made other arrangements with the instructor.

**Incomplete Grade Policy:** Incompletes can be given if you complete 75% of the course work with at least a 70% average. Students who want an incomplete grade should meet with the instructor and make a request for the grade and have a plan for completing the required work.

**Withdrawal Policy:** If you wish to drop the class, please do so yourself. The instructor will not be responsible, unless you make a specific request prior to the drop deadline. The drop deadline for each semester is can be found in the [Texarkana College Catalogue](https://www.texarkanacollege.edu/) (<https://www.texarkanacollege.edu/>). After the drop deadline the student that fails to complete the class with a satisfactory grade will receive a grade of "F". The student's final attendance date will be reported with the grade of "F".

**Testing Center Policy:** During the semester you may be asked to take examinations in the Texarkana College Assessment and Testing Center located in Room 11 of the Business and Computer Technology Building. The hours of operation, policies and procedures for the testing center can be found on the Texarkana College Web Page at <https://www.texarkanacollege.edu/>. The policies of the Texarkana College Assessment and Testing Center must be studied and closely followed.

**Student Services:** Student Services is located on the first floor of the Administration Building and offers many services to TC students. These include campus housing, student handbook, awards and recognition, student insurance, and scholarships. The web address is <https://www.texarkanacollege.edu/>.

**Student Support Services:** Student Support Services helps students by offering career information, tutoring, study skills, and college transfer information. Student Support Services is located in Room 106 of the Career Education Center. The Web page for Student Support Services can be found at <https://www.texarkanacollege.edu/>.

**Academic Integrity Statement:** Scholastic dishonesty, involving but not limited to cheating on a test, plagiarism, collusion, or falsification of records will make the student liable for disciplinary action after being investigated by the Dean of Students. Proven violations of this nature will result in the student being dropped from the class with an "F". This policy applies

campus wide, including the TC Testing Center, as well as off-campus classrooms or lab sites. For more information students should refer to TC Student Handbook.

**Disability Act Statement:** Texarkana College complies with all provisions of the Americans with Disabilities Act and makes reasonable accommodations upon request. Please contact Larry Andrews at 903.823.3283, or go by the Recruitment, Advisement, and Retention Department located in the Administration building for personal assistance. If you have an accommodation letter from their office indicating that you have a disability which requires academic accommodations, present it the instructor so we can discuss the accommodations that you might need for this class. It is best to request these changes at the beginning if not before the start of class so there is ample time to make the accommodations. See Texarkana College Catalogue at: <https://www.texarkanacollege.edu/>

**Financial Aid:** Attention! Dropping this class may affect your funding in a negative way! If you drop, you could owe money to the college and/or federal government. Please check with the Financial Aid office before making a decision.

## Laboratory Notebook Rubric

<b>Objective Assessed</b>	<b>Mastery</b>	<b>Progressing</b>	<b>Non-mastery</b>
Use basic apparatus and apply experimental methodologies used in the chemistry laboratory.	The student can make accurate measurements and properly use the equipment in laboratory investigations.	The student either makes sloppy measurements with lab equipment or sometimes chooses the wrong equipment to use	The student does not make accurate measurements and apply measurements to lab investigations.
Demonstrate safe and proper handling of laboratory equipment and chemicals.	All safety precautions are followed, lab equipment is used properly, and materials are disposed of correctly.	Safety precautions are followed, lab equipment is used properly, and materials are disposed of correctly most of the time.	Safety precautions are not consistently followed, lab equipment is carelessly used, and materials are either left on lab table or not disposed correctly.
Conduct basic laboratory experiments with proper laboratory techniques.	All assigned labs are conducted to completion.	Labs are conducted, but student relies mainly on their partner's work and does little to contribute to the overall lab experience.	Minimum participation in lab experiments.
Make careful and accurate experimental observations.	Data is clearly written for each lab.	Data is included for each lab, but it is not in a clear format such as a table.	No observations or data are recorded, or is so sloppy that it cannot be assumed to be a careful and accurate observation.
Relate physical observations and measurements to theoretical principles.	Conclusions, implications, or applications the student makes from lab data demonstrate an understanding of the chemistry concept.	A vague association of chemistry concepts and lab data is made by the student in conclusions, implications, or applications.	It is not clear from the conclusions, implications, or applications made that the student has a broad understanding of how the lab investigation relates to a chemistry concept.
Interpret laboratory results and experimental data, and reach logical conclusions.	A logical conclusion is reached in each lab. The student thoroughly describes how the data helped to lead to the conclusion.	Conclusions are only vaguely supported by data.	Conclusions are either not made or not supported by lab data.
Record experimental work completely and accurately in laboratory notebooks and communicate experimental results clearly in written reports.	All lab reports are neat and complete.	Most lab reports are neat and complete.	Few or no lab reports are neat and complete.
Design fundamental experiments involving principles of chemistry.	The student is able to develop a testable question, identify the variables, make a hypothesis, outline steps in an investigation, clearly write data, and make conclusions. This is demonstrated by a lab report for each lab investigation.	The student's lab reports include most but not all parts of a mastery lab report.	The student does not show evidence in lab reports of being able to develop a testable question, identify the variables, make a hypothesis, outline steps in an investigation, clearly write data, and make conclusions

