

CHEM 1412 General and Quantitative Chemistry II**Faculty contact:**

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Introduction: *General and Quantitative Chemistry II*. 4 Semester Hours: 8 hours of lectures and 12 hours of laboratory per week. This course is part of the University Studies core courses and will meet criteria for laboratory science credits.

Student Learning Outcomes and Objectives: This is the second part of a two-course sequence of general chemistry. The course is designed primarily for the students majoring in sciences or in pre-professional programs. By the end of the course you will be familiar with a range of chemistry topics including chemical reaction rates, chemical equilibrium, acid-base chemistry, solubility, thermodynamics, electrochemistry, nuclear chemistry, organic chemistry, inorganic chemistry and biological chemistry. Chemists deal with these subject areas every day, but these concepts are also crucially important to other branches of science and technology.

Course Materials:

Textbook: *General Chemistry*, 9th Edition, Ebbing, Gammon, Houghton Mifflin Company, New York, NY, copyright 2009.

Experiments in General Chemistry, 9th Edition, by R.A.D. Wentworth, published by Houghton Mifflin Company, New York, NY.

A pair of safety goggles and a padlock

Classroom: Lecture M-Th 9:00 -10:45 am in Science 127

CHEM 102: Tutorial M-Th 1:00 -1:50pm Science 135

Laboratory M-Th 2:00 - 5:50 pm in Science 310

Prerequisite: The student must have completed Math 141 or be concurrently enrolled in math 142 or other higher level courses in mathematics. Students who had adequate high school preparation in mathematics or were exempted from Math 141 will be allowed to enroll with the instructor's consent. Concurrent enrollment of Math 141 with CHEM 112 generally is not encouraged. Students who are currently enrolled in math remediation courses such as PJCM 300, PJCM 306, or Math 131 will not be eligible for enrollment in CHEM 112.

Attendance Policy: All students are expected to attend classes on a regular basis. The Department of Chemistry adheres to the attendance policy set by the University as stated in the most current Undergraduate Catalog. The attendance record is taken from the **daily quizzes**. A student who is late by more than 5 minutes or misses a daily quiz will be counted as missing a lecture. Excessive absence is defined as missing more than 10% of the lectures or more than 10% of the laboratory sessions without excusable reasons. Excessive absence will be reported to the Dean of the College and the Dean of Students. In addition, **according to the TAMU-Commerce Procedure A13.02, if a student has excessive absences, the instructor may drop the student from the course.** The instructor will only excuse an absence if the student provides, with appropriate document, an excusable reason allowed by the TAMU-Commerce Procedure A13.02. Good class attendance will be necessary in order to pass this course.

Student Conduct Policy: All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment (see Student's Guidebook, Policies and Procedures, Conduct). Any student engaging in disruptive behavior will be dismissed from class on the first offence. A second offence may constitute dismissal from the course with a failing grade.

Cheating and other Breaches of Academic Conduct: Academic cheating, plagiarism, and other forms of academic misconduct may result in removal of the student from class with a failing grade or may in extreme cases result in suspension or expulsion from the University as described in the Code of Student Conduct section of the Student's Guidebook.

Students with Disabilities: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact: **Office of Student Disability Resources and Services, Texas A&M University-Commerce, Halladay Student Services Building, Room 303 A/D, Phone (903) 886-5150 or (903) 886-5835, Fax (903) 468-8148** StudentDisabilityServices@tamu-commerce.edu

Pointers to Succeed in CHEM 1412:

1. The lectures in this course will cover topics from Chapters 12 through 24 of the assigned textbook. This material will be covered at the rate indicated by the *Tentative Class Schedule*. *Be sure to read the textbook before coming to the lectures*. The lectures will focus on important chemistry concepts but will not serve as a substitute for reading the textbook. The textbook is a more detailed presentation with a more extensive set of example problems. Chemistry is a physical science and it is imperative to master calculations to pass the course.
2. *Finish your homework promptly*. Even though the homework is not turned in or graded, you will have exams throughout the semester.
3. *Read the experiment carefully before coming to lab*. A Pre-Lab assignment will be due at the beginning of each laboratory session. The Pre-Lab will be graded and account for 25% of the total lab grade. Therefore, it is necessary to read and understand the concepts as well as the procedure involved in the experiment carefully beforehand. The lab report is due at the beginning of the next laboratory session.
4. *Be professional*. 5% of the lab grade is dependent on your behaviors in the lab, such as adherence to the safety rules, keeping your bench neat during the laboratory and cleaning up your laboratory area throughout the lab period.

Grading/Evaluation

The grade for this course will be derived as follows:

CHEM 1412: Lecture and Laboratory (graded as a single 4-credit hour course.)

Lecture Portion: 75% of course grade

Four examinations 60% of lecture grade (45% of course grade)

Final Exam 40% of lecture grade (30% of course grade)

Late work will not be accepted, and makeup quizzes or exams will not be given. If you miss an exam, for whatever reason, the points for the missed exam will be placed on your final exam, making your final exam count for a greater percentage of your grade. The final exam will be comprehensive and cover material from Chapters 12-24. Grading will be based on a scale: 100-85 = A; 84-70 = B; 69-56 = C; 55-45 = D; 45-below = F. Dishonest scholarship will earn an automatic zero (0) and initiate prosecution to the fullest extent. Incomplete grades may be given only if the student has a current average $\geq 70\%$ and is precluded from completion of the course by a documented illness or family crisis. Laboratory Portion: 25% of course grade. Ten laboratory reports will be required. You can miss one lab but any additionally missed labs will result in a zero for that lab.

Prelab	25%
Conduct, lab cleanliness	5%
Lab report	70%
Total	100%

Lecture Calendar

Week	Date	Chapter	Topics
1	July 13	Chapter 12	Solutions
	July 14	Chapter 12/13	Solutions/ Rates of Reaction
	July 15	Chapter 13	Rates of Reaction
	July 16	Chapter 14	Chemical Equilibrium
2	July 20	Chapters 14	Chemical Equilibrium
	July 21	Chapter 15	Acids and Bases
	July 22	Chapter 15/16	Acids and Bases/ Acid-Base Equilibria
	July 23	Chapters 16	Acid-Base Equilibria
3	July 27	Chapter 16	Acid-Base Equilibria
	July 28	Chapter 17	Solubility and Complex-Ion Equilibria
	July 29	Chapter 17	Solubility and Complex-Ion Equilibria
	July 30	Chapter 18	Thermodynamics and Equilibrium
4	August 3	Chapter 18	Thermodynamics and Equilibrium
	August 4	Chapter 19	Electrochemistry
	August 5	Chapter 19	Electrochemistry
	August 6	Chapters 20	Nuclear Chemistry
5	August 10	Chapters 20	Nuclear Chemistry
	August 11	Chapters 23	Organic Chemistry
	August 12	Chapters 23/24	Organic and Polymer Materials
	August 13	Final Examination	Chapters 12-24

Laboratory Calendar

Week	Date	Experiment
1	July 13	Nothing scheduled
	July 14	Check in equipment, Safety quiz and lecture
	July 15	12B: Softening Hard Water
	July 16	Experiment 14A: Le Chatelier's Principle
2	July 20	Experiment 14B: Determination of an Equilibrium Constant
	July 21	Exam 1
	July 22	Experiment 22B: Qualitative Analysis of Cr^{3+} , Fe^{3+} and Cu^{2+}
	July 23	Experiment 16A: Equilibria with Weak Acids and Weak Bases
3	July 27	Experiment 16B: An Acid-Base Titration Curve
	July 28	Exam 2
	July 29	Experiment 17A: A Solubility Product Constant
	July 30	Experiment 17B: Qualitative Analysis of Ag^+ , Cu^{2+} , Zn^{2+} , and Ca^{2+} ions
4	August 3	Nothing scheduled
	August 4	Exam 3
	August 5	Experiment 19A: Oxidation-Reduction Reactions
	August 6	Laboratory Check-Out
5	August 10	Exam 4
	August 11	Experiment 23: Molecular Models of Organic Molecules
	August 12	Nothing scheduled