

General Chemistry II (CHEM 1312)



Credit: 3 semester credit hours (3 hours lecture)

Prerequisite: CHEM 1311 and CHEM 1111

Co-requisite: CHEM 1112 General Chemistry II Lab

Course Description

Chemical equilibrium; phase diagrams and spectrometry; acid-base concepts; thermodynamics; kinetics; electrochemistry; nuclear chemistry; an introduction to organic chemistry and descriptive inorganic chemistry.

Required Textbook and Materials

1. *Chemistry, The Central Science*, 12th Edition, by Brown, LeMay, Bursten, Murphy, and Woodward, with MasteringChemistry®, ISBN13:9781292021522
2. A package of #882 Scantrons and #2 pencils.
3. Scientific Calculator – no graphing calculators allowed!
4. Will be using Blackboard for this course

Objectives

Course Objectives

Upon completion of this course, the student will be able to:

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.

Core Objectives

1. Critical Thinking Skills: To include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
2. Communication Skills: To include effective development, interpretation and expression of ideas through written, oral, and visual communication
3. Empirical & Quantitative Skills: To include the manipulation and analysis of numerical data or observable facts resulting in informed conclusion
4. Teamwork: To include the ability to connect choices, actions, and consequences to ethical decision-making

Course Outline

- | | |
|---|---|
| A. Liquids and Intermolecular Forces | I. Chemical Thermodynamics |
| B. Solids and Modern Materials | J. Electrochemistry |
| C. Properties of Solutions | K. Nuclear Chemistry |
| D. Chemical Kinetics | L. Chemistry of the Nonmetals |
| E. Chemical Equilibrium | M. Transition Metals and Coordination Chemistry |
| F. Acid-Base Equilibria | N. The Chemistry Life: Organic and Biological Chemistry |
| G. Additional Aspects of Aqueous Equilibria | |
| H. Chemistry of the Environment | |

Grade Scale

90 – 100	A
80 – 89	B
70 – 79	C
60 – 69	D
0 – 59	F

Course Evaluation

Final grades will be calculated according to the following criteria:

1. 4 Unit Tests	50%
2. Comprehensive Final Exam	20%
3. Homework	20%
4. Notebook	10%

Course Requirements

1. Written report.
2. Professional Resume.
3. Construct a scale model.
4. Perform the 'Library Treasure Hunt'.

Course Policies

Revised 2013

CHEM 1312

Course Syllabus

1. No food, drinks, or use of tobacco products in class.
2. Beepers, telephones, headphones, and any other electronic devices must be turned off while in class.
3. Do not bring children to class.
4. No late assignments will be accepted.
5. Students that miss a test must make up the test the day they return to class. It is the student's responsibility to make arrangements to make up test.
6. Attendance Policy. Two absences are allowed. If a student is tardy to class or departs early three (3) times, it will be equal to one (1) absence. Each absence beyond two absences will result in a 5 point deduction from your final grade.
7. The student is responsible for initiating and completing the drop process. A student who stops coming to class and fails to drop the course, will earn an 'F' in the course.
8. Additional class policies as defined by the individual course instructor.

Disabilities Statement

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409) 880-1737 or visit the office in Student Services, Cecil Beeson Building.

Course Schedule

Week	Topic
One	Course introduction and policies Liquids and Intermolecular Forces
Two	Solids and Modern Materials
Three	Properties of Solutions
Four	Chemical Kinetics
Five	Chemical Equilibrium
Six	Acid-Base Equilibria
Seven	Additional Aspects of Aqueous Equilibria
Eight	Chemistry of the Environment
Nine	Chemical Thermodynamics
Ten	Electrochemistry

CHEM 1312
Course Syllabus

Eleven	Nuclear Chemistry
Twelve	Chemistry of the Nonmetals
Thirteen	Transition Metals and Coordination Chemistry
Fourteen	Continue
Fifteen	The Chemistry of Life: Organic and Biological Chemistry
Sixteen	Review
Final Exam	<i>Given on the date and time specified by the official exam schedule</i>

CHEM 1312
Course Syllabus

Contact Information:

Instructor: Mr. J. Doe
Office: Office 111, Technology Center
Telephone: (409) 880-0000
E-mail: John.doe@lit.edu
Office Hours: 10-11 a.m. MWF; 3-4 p.m. MW; 11-3 p.m. TR

Additional course information could be
added here.

The 'base' syllabi plus additional
pages will be linked to the faculty
member's webpage.