CHEM C180L: GENERAL CHEMISTRY A LAB

Item	Value
Top Code	190500 - Chemistry, General
Units	1 Total Units
Hours	72 Total Hours (Lab Hours 72)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)
Local General Education (GE)	• CL Option 1 Natural Sciences (CB1)
California General Education Transfer Curriculum (Cal-GETC)	• Cal-GETC 5C Laboratory Activity (5C)
Intersegmental General Education Transfer Curriculum (IGETC)	• IGETC 5C Laboratory Activity (5C)
California State University General Education Breadth (CSU GE-Breadth)	• CSU B3 Laboratory Activity (B3)

Course Description

Introduction to both the principles and mathematical analysis of general chemistry lab techniques, especially for students intending to proceed with further chemistry courses. Topics include atomic structure and bonding, the stoichiometry of chemical equations, thermochemistry, and the behavior of gases and solutions. PREREQUISITE: CHEM C130, or a recent high school chemistry course with a grade of C or better, and a course taught at the level of intermediate algebra or appropriate math placement. COREQUISITE: CHEM C180. Transfer Credit: CSU; UC. C-ID: CHEM 110, CHEM 120 S.**C-ID:** CHEM 110, CHEM 120 S.

Course Level Student Learning Outcome(s)

1. Perform laboratory experiments accurately and record significant data.
2. Separate a mixture using the physical properties of the components.
3. Analyze data using graphs
4. Classify chemical reactions
5. Determine the heat of reaction, specific heats of metals
6. Conduct and analyze the results of an acid-base titration

Course Objectives

- 1. Perform basic laboratory exercises including mass, volume, and temperature determination; volumetric titrations; and gravimetric separations.
- 2. Perform experiments in the chemistry lab safely and reproducibly
- 3. Analyze experimental data and report finding using graphical analysis and experimental uncertainty

Lecture Content

Acquisition and practice in chemistry laboratory skills in measurement, separation, spectroscopy, titrations, as well as data analysis, graphing and calculations. Experiments include: Separation of a Mixture Spectroscopy of Dyes Chemical Reactions Gas Laws Thermochemistry Analysis of the Hydrogen Spectrum Building Lewis Structures Acid/Base Titrations Heat of Vaporization Freezing Point Depression

Lab Content

Separation of Mixtures Measurements and Identification Techniques Density, Accuracy, Precision and Graphing Empirical Formulas Classification of Chemical Reactions Thermochemistry Gas Law Studies Lewis Structures and Building Molecular Models Acids and Bases: Reactions and Standardization Acids and Bases: Analysis Cooling Curves

Method(s) of Instruction

- Lab (04)
- DE Live Online Lab (04S)
- DE Online Lab (04X)

Instructional Techniques

Hand-on laboratory experimentation Demonstration

Reading Assignments

Pre-Lab Exercises Post-Lab Exercises

Out-of-class Assignments

Laboratory Reports

Demonstration of Critical Thinking

Graphs, calculations and explanations included in laboratory reports and quizzes

Required Writing, Problem Solving, Skills Demonstration

On time completion of lab assignments and reports

Eligible Disciplines

Chemistry: Masters degree in chemistry OR bachelors degree in chemistry or biochemistry AND masters degree in biochemistry, chemical engineering, chemical physics, physics, molecular biology, or geochemistry OR the equivalent. Masters degree required.

Manuals Resources

1. Dupon, J.W.. CHEM 180L Lab Manual:Experimentation in General Chemistry, Creative Commons , 01-29-2024 2. Murov, S.L., Stedjee, B.. Experiments and Exercises in General Chemistry, Wiley , 07-15-2020

Other Resources

1. Coastline Library