CHEM 1225

Division: Natural Science and Mathematics
Department: Chemistry
Course: CHEM 1225
Title: Principles of Chemistry Laboratory II
Catalog Description:

This chemistry lab course is to be taken concurrently with CHEM 1220. This course is designed to give students experience with lab experiments related to kinetics, equilibrium, acid-base chemistry and qualitative analysis.

General Education Requirements: Physical Science
Semesters Offered: TBA
Credit/Time Requirement: Credit: 1; Lecture: 0; Lab: 3
Clock/Hour Requirements: 0
Offered for Non-Credit: No
Prerequisites: CHEM 1210 and CHEM 1215

Corequisites: CHEM 1220

Justification:

This is a standard freshman chemistry laboratory course that is required for majors in any Natural Science or Premedical area. This course teaches data collection skills, and demonstrates how information can be obtained using the experimental method. The basic problem solving and laboratory skills learned in this course are valuable in many areas. This course is called CHEM 1225 by all state schools in Utah. The course is transferable to every major school in Utah and is accepted in other states as well.

Student Learning Outcomes:

Students will be able to do routine laboratory procedures, know how to obtain meaningful experimental data, and understand basic chemical processes related to the content of this course. Students will also know how to s olve laboratory problems related to the content of this course.

Content:

Students will study the following in a laboratory setting:

Safety and Orientation of Laboratory Equipment

Molar Mass by Freezing Point Depression

Rates of Chemical Reactions

Determination of an Equilibrium Constant

Acid/Base Titration

Qualitative Analysis of Group I, II and III cations

Determination of Equivalent Mass by Electrolysis

General Education Outcomes:

6) Apply computational skills to a variety of contexts.

Most experiments require not only an understanding of the step-by-step process required to solve the problem, but also an overall understanding of chemical principles being applied. Each laboratory experiment requires different computational skills to obtain desired, accurate results as determined from the lab write-ups.

7) Apply scientific reasoning to a variety of contexts.

Students are expected to apply scientific reasoning throughout this laboratory course. For example, in the qualitative analysis labs students are given an unknown that could contain a number of different ions. Students must use chemical tests and scientific reasoning to determine which of the possible ions are actually in their unknown. This reasoning not only allows them to solve problems in the experiment, but also to learn, remember and interrelate chemical principles encountered in this course, in future courses, and in life. Reasoning ability is assessed from the laboratory exercises and in the lab final.

Key Performance Indicators:

Students will be assessed on a weekly basis through laboratory reports and prelabs. Homework in the form of pre-lab exercises will be assigned for each lab. A midterm and final exam will be used to assess progress in laboratory skills and understanding of the labs completed. Final grades will be determined by approximately 5 5% laboratory reports, 10% pre-lab exercises, and 35% exams.

Representative Text and/or Supplies:

Slowinski, Emil J., Wolsey, Wayne C., and Masterton, William L. *Chemistry Principles in the Laboratory*, current edition, Harcourt College Publishers, Orlando, FL.

Optimum Class Size: 20
Maximum Class Size: 24

Signatures:

I hereby submit this course syllabus:

Dan Black, EdD, Associate Professor

I hereby find this course consistent with the goals and resources of the Chemistry Department:

Mark Wathen, PhD, Assistant Professor, Chair

I hereby find this course consistent with the goals and resources of the Natural Science and Mathematics Division:

Dan Black, EdD, Associate Professor, Dean

I have discussed the need for library resources related to this class with the person submitting the syllabus:

Lynn Anderson, MLIS, Technical Services Librarian (Main Campus)

Michelle Olsen, MLS, Campus Librarian (Richfield Campus)