CHEM 1215

Division: Natural Science and Mathematics
Department: Chemistry
Course: CHEM 1215
Title: Principles of Chemistry Laboratory I
Catalog Description:
This course is an introduction to the chemistry laboratory as it applies to present day chemistry. This course must be taken concurrently with Chem 1210.
General Education Requirements: N/A
Semesters Offered: TBA
Credit/Time Requirement: Credit: 1; Lecture: 0; Lab: 3
Clock/Hour Requirements: 0
Offered for Non-Credit: No
Prerequisites: High School Chemistry or College Chemistry course, and Math 1011

Corequisites: Chem 1210, concurrent enrolement in or completion of Math 1050

Justification:
This is a standard freshman chemistry laboratory course that is required for majors in any Natural Science, Engineering, or Premedical areas. 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 1230 by the University of Utah and Utah State University. The course is transferable to every major school in Utah and is accepted in other states as well.

Student Learning Outcomes:
At the conclusion of this course a student should be able to do routine laboratory procedures, know how to obtain meaningful experimental data, and understand basic chemical processes, the mole concept, and have sufficient knowledge of chemistry solve problems related laboratory problems.

Content:

Lab 1 Safety procedures, how to report data (Lab. Write-ups, calculations and significant figures.)

Lab 2 Density of liquids and solids

Lab 3 Paper chromatography

Lab 4 & 5 Determination of a chemical formula

Lab 6 Analysis of an unknown chloride

Lab 7 Molar mass of a volatile liquid

Lab 8 Midterm

Lab 9 Heat effects and calorimetry

Lab 10 Atomic Spectrum of Hydrogen

Lab 11 Analysis of an aluminum-zinc alloy

Lab 12 Two families in the periodic table

Lab 13 Geometrical structures of molecules, clean-up and check-out

Lab 14 Lab Final

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 laboratroy experiment requires different computational skills to obtain desired, accurate results.

7) Apply scientific reasoning to a variety of contexts.
Students are expected to apply scientific reasoning throughout this laboratory course. For example, the students are asked to determine the density of an unknown solid. They are asked not only to conduct the procedure, but also to use scientific reasoning to determine what errors in the procedure would cause the density to be higher or lower than the actual density of the solid. 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.

Key Performance Indicators:
Students will be assessed on a week-by-week 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 completed labs.

Representative Text and/or Supplies:
Slowinski, Emil H., Wolsey, Wayne C., Masterton, William L. *Chemistry Principles in the Laboratory*, Seventh or current Edition, Saunders College Publishing, Philadelphia, PA

Optimum Class Size: 20
Maximum Class Size: 24

Signatures:

I hereby submit this course syllabus:

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

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Mark Wathen, PhD, Assistant Professor, Chair

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

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Dan Black, EdD, Associate Professor, Dean

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

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

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Michelle Olsen, MLS, Campus Librarian (Richfield Campus)