



## 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:** N/A

**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 1230

**Corequisites:** Chem 1220

**Justification:**

This is a standard freshman chemistry laboratory course that is required for majors in any Natural Science, Engineering, 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 1240 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, solution chemistry and have sufficient knowledge of chemistry solve problems related laboratory problems.

**Content:**

Lab 1 Safety, check-in and orientation to lab

Lab 2 Molar Mass by Freezing Point Depression

Lab 3 Rates of Chemical Reactions I

Lab 4 Rates of Chemical Reactions II

Lab 5 Determination of an Equilibrium Constant

Lab 6 Titration Part I

Lab 7 Titration Part II

Lab 8 Midterm

Lab 9 Qualitative Analysis of Group I and II

Lab 10 Qualitative Analysis of Group II

Lab 11 Determination of Equivalent Mass by Electrolysis

Lab 12 Qualitative Analysis of Group III

Lab 13 Qualitative Analysis of Group III

Lab 14 The Ten Tube Mystery and 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 laboratory 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, 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.

### **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.

### **Representative Text and/or Supplies:**

Slowinski, Emil H., Wolsey, Wayne C., Masterton, William L. *Chemistry Principles in the Laboratory*, Seventh 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)