



CHEM 1220

Division: Natural Science and Mathematics

Department: Chemistry

Course: CHEM 1220

Title: Principles of Chemistry II

Catalog Description:

This course is a continuation of Chem 1210. The principles of equilibrium, kinetics and solution chemistry are applied to present-day chemistry. This course is for students in the natural sciences such as Chemistry, Physics, Biology, Engineering and Pre-medical areas who will take additional chemistry courses.

General Education Requirements: Physical Science

Semesters Offered: TBA

Credit/Time Requirement: Credit: 4; Lecture: 4; Lab: 0

Clock/Hour Requirements: 0

Offered for Non-Credit: No

Prerequisites: A grade of C- or higher in Chem 1210

Corequisites: Chem 1225

Justification:

This is a standard freshman chemistry course that is required for majors in any Natural Science, Engineering, or Premedical area. Medical and science related fields use chemistry as a background for understanding courses in biochemistry, biology, geology or physics. The basic problem-solving skills learned in this course are valuable in many areas. This course is called Chem 1220 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:

At the conclusion of this course a student should understand basic chemical processes, equilibrium, kinetics, and solution chemistry, and have sufficient knowledge of chemistry to solve problems related to the area covered in this course.

Content:

Unit I Chemical Kinetics--Rate of Reaction

Unit II Chemical Equilibrium

Unit III Acids and Bases

Unit IV Acid-Base and Solubility Equilibria

Unit V Transition Metal Chemistry and Coordination Compounds

Unit VI Chemistry of the Atmosphere

Unit VII Entropy, Free energy and Equilibrium

Unit VIII Electrochemistry

Unit IX Metallurgy and the Chemistry of Metals

Unit X Qualitative Analysis

Unit XI Nuclear Reactions

Unit XII Organic Chemistry

Unit XIII Synthetic and Natural Organic Polymers

General Education Outcomes:

6) Apply computational skills to a variety of contexts.

Most problems in Chem 1220 are "story problems" that 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 chapter presents new concepts that require different computational skills to solve problems.

7) Apply scientific reasoning to a variety of contexts.

Students are expected to apply scientific reasoning throughout the course. This reasoning not only allows them to solve problems, 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 in-class quizzes and tests. Homework will be assigned and graded daily to give students the opportunity to check their own progress. A portion of each test is made up of problems that must be setup and solved or questions that can be answered in an essay format; another portion of each test consists of multiple choice questions. The final is comprehensive and can be used to replace the student's lowest test score.

Representative Text and/or Supplies:

Chang, Raymond. *Chemistry*, Seventh Edition or current edition. McGraw-Hill Companies, Inc., New York, NY; Masterton, William L., and Hurley, Cecile N. *Chemistry Principles and Reactions*, Fourth Edition or current edition. Saunders College Publishing, Philadelphia, PA

Optimum Class Size: 30

Maximum Class Size: 48

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:

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)