Syllabus
CHEM 1100
General Chemistry II
2025

Committee Members:

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Facilitator: Dr. Aaron McLean

The Institution agrees to the contents in this syllabus including course prefix, number, course description and other contents of this syllabus.

11/26/2024 Chief Academic Officer, Central Community College		Adopt
Theresa Billiot Chief Academic Officer, Little Priest Tribal College	11/13/2024	Adopt
Tom McDonnell Chief Academic Officer, Metropolitan Community College	11/12/2024	Decline
Jody Tomanek Chief Academic Officer, Mid-Plains Community College	11/12/2024	Adopt
11/26/2024 Chief Academic Officer, Nebraska Indian Community College		Adopt
Charlene Widener Chief Academic Officer, Northeast Community College	11/14/2024	Adopt
Joel Michaelis Chief Academic Officer, Southeast Community College	11/13/2024	Adopt
Grant Wilson Chief Academic Officer, Western Nebraska Community College	11/12/2024	Adopt

I. CATALOG DESCRIPTION

Course Number: CHEM1100
Course Title: General Chemistry II
Prerequisite(s): CHEM1090 - General Chemistry I

Catalog Description: This is the second course of a comprehensive chemistry sequence. Topics include solutions, kinetics, equilibrium, acid-base reactions, solubility, thermodynamics, and electrochemistry.

Credit Hours: 4 Semester; 6 Quarter
Contact Hours: 45 (lecture) / 30 (lab)

II. COURSE OBJECTIVES / COMPETENCIES

Course will:

1. Expand upon the correct structures and diagrams of atoms, ions, and molecules.
2. Integrate calculations involving concentrations and colligative properties.
3. Disseminate the effects of thermodynamic and kinetic factors on chemical reactions.
4. Describe the relationships between ion concentration and the equilibrium constant.
5. Introduce pH calculations involving strong acids, weak acids, strong bases, weak bases, salts, buffers, common-ion mixtures, and neutralization reactions.
6. Delineate solubility concepts to qualitative and quantitative situations.
7. Introduce the effects of enthalpy, entropy, and Gibb's free energy on the spontaneity of chemical reactions.
8. Describe the principles of electrochemistry in multiple situations including the analysis of electrochemical cells.

III. STUDENT LEARNING OUTCOMES:

Students will be able to:

1. Calculate solution concentrations.
2. Apply principles of colligative properties.
3. Apply principles of chemical kinetics.
4. Perform calculations involving chemical equilibria.
5. Predict reaction outcomes based on chemical equilibria and LeChatlier's principle.
6. Demonstrate an understanding of the properties of acids and bases, including pH, buffers, acid and base equilibria in weak acids and bases and acid-base equilibrium constants.
7. Describe the relationships between enthalpy, entropy, and Gibb's free energy.
8. Demonstrate an understanding of oxidation-reduction reactions in terms of electron transfer.
9. Explain the electrical nature of reactions and electrochemical cells in terms of oxidation-reduction reactions.
10. Demonstrate the ability to perform lab experiments safely, to interpret the data collected, and to draw reasonable conclusions based on the data.

IV. COURSE CONTENT / TOPICAL OUTLINE

1. Solutions
2. Chemical kinetics
3. Chemical equilibria
4. Acids and bases
5. Thermodynamics
6. Electrochemistry

V. INSTRUCTIONAL MATERIALS

A. Required Text(s) Suggested

1. OpenStax Chemistry or other appropriate open education resources
2. Chemistry, Burdge
3. Chemistry: A Molecular Approach, Tro
4. General Chemistry, McQuarrie
5. General Chemistry, Ebbing
6. Essentials of General Chemistry, Ebbing
7. Chemistry, Robinson et. al
8. General Chemistry: Atoms First, McMurry and Fay
9. Chemistry, Overby
10. Chemistry: The Central Science, Brown and LeMay

VI. METHOD OF PRESENTATION/INSTRUCTION

1. Lecture
2. Discussion
3. Demonstration
4. Group activity
5. Application
6. On-Line
7. Distance education
8. Laboratory activities

VII. METHODS OF EVALUATION

Course grades, at the determination of the instructor, may be based on participation, assignments, exams, projects, papers, and lab work. Instructors will distribute and discuss evaluation and his/her grading policies with students at the beginning of each term.

VIII. INSTITUTIONAL DEFINED SECTION

(*To be used at the discretion of each community college as deemed necessary)*