









**Syllabus**  
**CHEM 1100**  
**General Chemistry II**  
**2022**

**Committee Members:**

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Dr. Aaron McLean, Mid-Plains Community College  
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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.**

 Chief Academic Officer, Central Community College	04/07/2022	Adopt
 Chief Academic Officer, Little Priest Tribal College	03/28/2022	Adopt
 Chief Academic Officer, Metropolitan Community College	03/28/2022	Decline
 Chief Academic Officer, Mid-Plains Community College	03/28/2022	Adopt
 Chief Academic Officer, Nebraska Indian Community College	04/04/2022	Adopt
 Chief Academic Officer, Northeast Community College	03/28/2022	Adopt
 Chief Academic Officer, Southeast Community College	04/04/2022	Adopt
 Chief Academic Officer, Western Nebraska Community College	03/28/2022	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, current ed.
2. Chemistry, Burdge, current ed.
3. Chemistry: A Molecular Approach, Tro, current ed.
4. General Chemistry, McQuarrie, current ed.
5. General Chemistry, Ebbing, current ed.
6. Essentials of General Chemistry, Ebbing, current ed.
7. Chemistry, Robinson et. al, current ed.
8. General Chemistry: Atoms First, McMurry and Fay, current ed.
9. Chemistry, Chang, current ed.
10. Chemistry: The Central Science, Brown and LeMay, current ed.

#### **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)*