

# North Hennepin Community College

## CHEM 1062: Principles of Chemistry II

### A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: 0

Lab Hours/Week: 0

OJT Hours/Week: \*.\*

Prerequisites:

This course requires the following prerequisite

CHEM 1061 - Principles of Chemistry I (Minimum grade: 1.67 GPA Equivalent)

Corequisites: None

MnTC Goals: Goal 03 - Natural Science

A continuation of CHEM 1061, this course emphasizes chemical equilibrium, solution chemistry, acid-base chemistry, precipitation reactions, complex ion formation, oxidation-reduction, and electrochemical reactions. The laboratory portion includes experimental applications of the lecture topics: determination of cation and anion (qualitative) content of unknown mixture, kinetics, acid-base equilibria, solubility, thermodynamics, electrochemistry, and an introduction to nuclear chemistry. CHEM 1061 is required for this course. (3 hours lecture, 3 hours lab)

**B. COURSE EFFECTIVE DATES:** 07/17/1997 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. States of Matter
2. Solutions
3. Kinetics
4. Chemical Equilibrium
5. Equilibrium of Acids and Bases
6. Applications of Equilibrium
7. Thermodynamics
8. Electrochemistry
9. Coordination Chemistry
10. Organic Chemistry

## **D. LEARNING OUTCOMES (General)**

1. Describe solution properties and chemistry. (MnTC G3, comp. a: NHCC ELO 1, AS 1)
2. Derive and describe reaction kinetics. (MnTC G2, comps. a, c; MnTC G3, comps. a, b, c; NHCC ELO 1, AS 1)
3. Describe and manipulate equilibria for chemical reactions. (MnTC G2, comps. a, c; MnTC G3, comps. a, b; NHCC ELO 1,4, AS 1, 2)
4. Apply equilibrium principles to acid-base chemistry, and solubility of solids. (MnTC G2, comp. a; MnTC G3, comps. a, b, c; NHCC ELO 1,4, AS 1, 2)
5. Describe and apply the three laws of Thermodynamics. (MnTC G2, comp. a; MnTC G3, comps. a, b, c; NHCC ELO 1, 2, 4, AS 1, 2, AS 1, 2)
6. Describe and apply electrochemistry concepts to chemical reactions. (MnTC G2, comp. a; MnTC G3, comps. a, b, c; NHCC ELO 1, 2, 4, AS 1, 2, 3, 4)
7. Describe the bonding in coordination chemistry. (MnTC G3, comp. a: NHCC ELO 1, AS 1)
8. Describe the basics of organic chemistry including functional groups and nomenclature. (MnTC G3, comp. a: NHCC ELO 1, AS 1)
9. Effectively communicate data, analysis, conclusions based on laboratory experiments. (MnTC G3, comp. a, b, c; NHCC ELO 2, AS 1, 2, 3 4)
10. Within the context of the course, evaluate effects of chemistry concepts on the societal issues. (MnTC 3, comp a, d; MnTC G2, comps. a, c, d; NHCC ELO 3, AS 3, 4)
11. Analyze experimental findings, statistical and graphical data sets and communicate them in writing. (MnTC Goal 3, comp. a, b, c; ELO 1, 2)
12. Perform laboratory skills following safety guidelines. (MnTC Goal 2, comps. a, b, c; MnTC Goal 3, comps. b & c, ELO 1, 2)
13. Identify and use resources in order to teach yourself course concepts. (ELO 1, 2, 3)
14. Recognize the interdisciplinary relationship among the science disciplines. (MnTC Goal 3, comp. d; ELO 1, 3, 4)
15. Utilize multiple chemistry topics in practical lab scenarios and problem solving. (MnTC Goal 2, comps. a, c; MnTC Goal 3, comps. a, b, c; ELO 1, 2, 4)

## **E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

### Goal 03 - Natural Science

1. Demonstrate understanding of scientific theories.
2. Formulate and test hypotheses by performing laboratory, simulation, or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, students' laboratory experience in the collection of data, its statistical and graphical analysis, and an appreciation of its sources of error and uncertainty.
3. Communicate their experimental findings, analyses, and interpretations both orally and in writing.
4. Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.

## **F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

## **G. SPECIAL INFORMATION**

1. Knowledge of Human Cultures and the Physical and Natural World--Through study in the sciences, mathematics, social sciences, humanities, histories, languages, the arts, technology and professions.
2. Intellectual and Practical Skills--Including: Inquiry and analysis; Critical and creative thinking; Written and oral communication; Quantitative literacy; Information literacy; Teamwork and problem solving.
3. Personal and Social Responsibility and Engagement--Including: Civic knowledge and involvement--campus, local and global; Intercultural knowledge and competence; Ethical reasoning and action; Foundations and skills for lifelong learning.
4. Integrative and Applied Learning--Including: Synthesis and advanced accomplishment across general education, liberal studies, specialized studies and activities in the broader campus community.