

North Hennepin Community College

CHEM 1010: Introduction to Chemistry

A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: 0

Lab Hours/Week: 0

OJT Hours/Week: *.*

Prerequisites:

This course requires any of these eight prerequisites

Placement into MATH 0980

Placement into MATH 0970/1010/1031/1130/1140

Placement into MATH 1150

Algebra College Level

Placement into MATH 1180

Placement into MATH 1170 or MATH 1200

Placement into MATH 1221

MATH 0980 - Pre College Algebra (Minimum grade: 1.67 GPA Equivalent)

Corequisites: None

MnTC Goals: Goal 03 - Natural Science, Goal 10 - People/Environment

An introduction to the basic concepts of Chemistry along with mathematical application, which include the atomic theory, periodic trends, stoichiometric relationships, kinetic-molecular theory, molecular structure, heat transfer, and chemical properties as related to the gas and liquid and solid phases.

Additionally, this course will explore the role that chemistry plays in our personal and professional lives.

This course enables students to think critically about current environmental issues in science. The lab portion contains experiments that includes observation, data collection and analysis, and mathematical applications that support the concepts being studied in class. The course is designed for non-science majors or students who have not completed chemistry in high school in order to prepare them to take Chem 1061 or courses in various health programs.

Prerequisite: Math 0900 or Math 0980 with a grade of 'C' or better.

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

C. OUTLINE OF MAJOR CONTENT AREAS

1. Course content will include but is not limited to: Metric system, atomic theory, molecular and empirical formulas of molecules, chemical reactions, stoichiometry, periodic table, chemical bonding, nomenclature, gas laws, solutions, acids and bases, basic organic chemistry.

D. LEARNING OUTCOMES (General)

1. Perform mathematical conversions in the metric system. (MnTC G2, comp. a; NHCC ELOs 1, 4)
2. Write chemical formulas given the name of the chemical and vice versa. (MnTC G3, comp. a; NHCC ELO 1)
3. Balance chemical equations. (MnTC G3, comp. a; ELO 1)
4. Perform stoichiometric problems. (MnTC G3, comp. a; NHCC ELOs 1, 2, 4)
5. Understand the structure of the atom and how it relates to chemical bonding. (MnTC G3, comp. a and MnTC G2, comp. a; ELO 1)
6. Understand and apply the interactions that occur between compounds and how they relate to the physical properties of the compound. (MnTC G3, comp. a, b, c and MnTC G2, comp. a, b, c; ELOs 1, 2)
7. Understand the gas laws and be able to perform gas law problems. (MnTC G3, comp. a, b, c and MnTC G2, comp. a, b, c; NHCC ELOs 1, 2)
8. Identify different types of solutions and perform pH and concentration problems. (MnTC G3, comp. a, b, c and MnTC G2, comp. a, b, c; NHCC ELOs 1, 2, 4)
9. Understand basic organic concepts (MnTC G2, comp. a; MnTC G3, comp. a; ELO 1)
10. Identify and use resources in order to teach yourself course concepts. (ELOs 2, 3)
11. Debate issues relating to current and historical environmental challenges, such as the use of pesticides in the agricultural industry, the use of mercury and lead in our homes and workplaces, developing different forms of energy given the world's dwindling resources, production and use of cancer causing chemicals, the chemical industry and their effect on our society. (MnTC G10, comps. b, c, d, e; MnTC G3, comp. d; MnTC G2, comps. a, b, c, d)(ELO 2,3)
12. Draw and interpret visual representations of chemical substances, chemical reactions and physical reactions using simple shapes. (MnTC G3, comp. a; and MnTC G2, comp. a, ELO 1)
13. Create and interpret graphs and tables that display scientific data (MnTC G3, comp. a, c; and MnTC G2, comp. a, ELO 1)
14. Demonstrate safe performance of laboratory skills in conducting experiments that explore the course concepts. (MnTC G2, comps. a, b, c; MnTC G3, comps. b & c, MnTC G10, comp. e, f; ELO 1, ELO 2)

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

Goal 03 - Natural Science

1. Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.
2. Demonstrate understanding of scientific theories.
3. 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.
4. Communicate their experimental findings, analyses, and interpretations both orally and in writing.

Goal 10 - People/Environment

1. Describe the basic institutional arrangements (social, legal, political, economic, religious) that are evolving to deal with environmental and natural resource challenges.
2. Evaluate critically environmental and natural resource issues in light of understandings about interrelationships, ecosystems, and institutions.
3. Propose and assess alternative solutions to environmental problems.
4. Articulate and defend the actions they would take on various environmental issues.

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.