

A. CATALOG DESCRIPTION (include prerequisites)

Course Title: Chemistry and Our World Today
Credits: 3
Hours/Week: 2 hours lecture and 2 hours lab per week
Semesters Offered: Fall, Spring
Prerequisites: None

This course meets the requirements for the Minnesota Transfer Curriculum in CT (Critical Thinking), NS (Natural Science) and PN (People and the Environment). This course is intended for nonscience majors and/or students that do not require any further chemistry courses.

This is an introductory lecture/laboratory course for non-science majors that investigates the world of chemistry, the nature of matter and our everyday interactions with chemicals. Elementary concepts of chemistry will be introduced as they relate to economic, political, environmental and social issues. Through this unique approach to studying chemistry, students will use critical-thinking skills to access the impact of chemicals in the modern world.

B. DATE LAST REVISED (use current date): December, 2004

C. RECOMMENDED ENTRY SKILLS/KNOWLEDGE:

12th grade reading and writing skills.

D. OUTLINE OF MAJOR CONTENT AREAS:

Chemical concepts will be introduced as they relate to major environmental concerns. Topics covered will be related to classical chemistry.

1. Chemical Concepts
 - a. Atomic structure and periodicity
 - b. Chemical bonding
 - c. Reactions
 - d. Energy, Workload and Heat

2. Environmental Issues
 - a. Acid rain
 - b. Air quality and ozone depletion
 - c. Nuclear energy and other energy sources
 - d. Global warming
 - e. Waste disposal
 - f. Water quality
 - g. Household chemicals
 - h. Designing drugs and manipulating molecules

D. OUTLINE OF MAJOR CONTENT AREAS: (continued)

Laboratory activities will be used to enhance, correlate and demonstrate a variety of methods of scientific inquiry. They will enhance understanding of concepts and open discussion. Reports and/or quizzes are handed in for evaluation.

E. LEARNING OUTCOMES (GENERAL):

1. Basic chemistry vocabulary
2. Using basic chemical principles and laws to help predict how any given variable may influence a given chemical change
3. Gain a perception of how chemistry plays a role in your everyday life activities
4. Learning is in the context of certain global, regional, or local environmental problems, which are chemical in nature.

F. LEARNING OUTCOMES (MNTC):

Critical Thinking

- a. Gather factual information and apply it to a given problem in a manner that is relevant, clear, comprehensive and conscious of the bias in the information selected
- b. Imagine and/or seek out a variety of possible goals, assumptions, or perspectives which can give meaning to a given problem
- c. Analyze the logical connections between facts, goals and assumptions relevant to a problem, and evaluate claims which may be said to follow from them
- d. Describe and improve one's own critical thinking and problem solving procedures

Natural Sciences

- a. Demonstrate understanding of scientific theories and the ways in which scientists develop, express, and question theories in the field of chemistry
- b. Formulate and test hypothesis by performing laboratory experiments requiring collection of data, its statistical and/or graphical analysis, and an appreciation of uncertainty and sources of error
- c. Communicate their findings, analyses, and interpretations with other students and/or instructor orally and/or in writing.

People and the Environment

- a. Be able to identify the chemical nature of certain environmental threats.
- b. Understand alternative solutions to environmental issues.
- c. Propose strategies for protecting natural resources.
- d. Understand how chemistry plays a significant role in our everyday lives.

G. METHODS FOR EVALUATION OF STUDENT LEARNING:

1. Laboratory reports and/or quizzes
2. Problem solving tests
3. Group project or report

H. SPECIAL INFORMATION (fees, directives on hazardous materials, etc.):

The initial lab session explains and familiarizes the student with general safety hazards and safety equipment in the lab. During the pre-lab discussion, the hazardous characteristics of the chemicals used during the lab are discussed. The students will be instructed on the proper disposal of any hazardous products. The instructor will direct all students to wear necessary protective equipment while working with the chemicals. A copy of Material Safety Data Sheets for chemicals used is available in the lab.