

Course discipline/number/title: CHEM 1100: Chemistry and Our World Today

A. CATALOG DESCRIPTION

1. Credits: 3
2. Hours/Week: 2 lecture, 2 lab
3. Prerequisites (Course discipline/number): None
4. Other requirements: College level reading
5. MnTC Goals (if any): Goal 3/Natural Sciences, and Goal 10/People and the Environment

B. COURSE DESCRIPTION: This course 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 assess the impact of chemicals in the modern world.

C. DATE LAST REVISED (Month, year): September, 2023

D. OUTLINE OF MAJOR CONTENT AREAS:

1. Matter and Energy
  - a) Elements, compounds, and mixtures
  - b) Atomic structure and periodicity
  - c) Chemical bonding and basic nomenclature
  - d) Lewis structures and molecular shape
  - e) Energy units
  - f) Heat, temperature, specific heat
2. Chemical Reactions and Stoichiometry
  - a) Types of chemical reactions
  - b) Balancing chemical equations
  - c) Mole concept
  - d) Elementary stoichiometry and limiting reactants
  - e) Heat transfer
3. Solutions
  - a) Dissolution process
  - b) Concentration units
  - c) Acid-Base chemistry
  - d) pH calculations
4. Environmental, Societal, Legal Issues
  - a) Household chemicals/Pharmaceuticals
  - b) Air and water quality
  - c) Pollution
  - d) Oxone depletion
  - e) Alternative energy source
  - f) Global warming

E. LEARNING OUTCOMES (GENERAL): The student will be able to:

1. Apply basic chemistry vocabulary.
2. Solve elementary chemical problems.
3. Use the scientific method to solve problems using experimental and/or simulated data, relate them to the chemical principles and laws involved, and communicate findings to appropriate audiences.
4. Recognize, articulate, and discuss how chemistry plays a role in everyday life activities, the environment, and major global issues.

F. LEARNING OUTCOMES (MNTC):

Goal 3/Natural Sciences: The student will be able to:

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, student's 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.

Goal 10/People and the Environment: The student will be able to:

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.

G. METHODS FOR EVALUATION OF STUDENT LEARNING: Methods may include but are not limited to:

1. Laboratory reports
2. Quizzes
3. Problem solving tests
4. Discussions
5. Essays

H. RCTC CORE OUTCOME(S): This course contributes to meeting the following RCTC Core Outcome(s):  
Communication. Students will communicate appropriately for their respective audiences.

Critical Thinking. Students will think systematically and explore information thoroughly before accepting or formulating a position or conclusion.

I. SPECIAL INFORMATION (if any):

The initial lab session explains and familiarizes the student with general safety hazards and safety equipment.