

Minnesota State College Southeast

CHEM 1122: Environmental Chemistry

A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 2

Lab Hours/Week: 2

OJT Hours/Week: *.*

Prerequisites: None

Corequisites: None

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

Environmental Chemistry introduces non-science students to the world of chemical processes, both natural and artificial, in their daily experiences. These phenomenon are related to current environmental issues in the context of human activities and influences. Topics discussed include air pollution, ozone depletion, global warming, acid rain, nuclear power issues, energy sources and the impact recycling has on our environment. (Meets MnTC Goals 3 & 10) (Prerequisite: none) (3 credits: 2 lecture/1 lab)

B. COURSE EFFECTIVE DATES: 07/20/2016 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. The atmosphere, ozone layer and global climate change
2. Energy from chemical, electrical and nuclear sources
3. Drinking water, pH and acid rain
4. Natural and synthetic polymers
5. Laboratory techniques

D. LEARNING OUTCOMES (General)

1. Understand the chemical composition of air and what common air pollutants are
2. Understand when ozone is a pollutant and when it is beneficial
3. Identify the relationship between the ozone layer and solar radiation
4. Identify greenhouse gasses, the carbon cycle and natural and anthropological sources of carbon dioxide with consideration of the scientific theory of global climate change and government policy
5. Relate energy work and heat to chemical bonds and conventional fuel sources
6. Discuss human consumption of energy and how it can be conserved
7. Understand the chemical properties of water and its role as a solvent
8. Identify dissolved materials and chemicals in drinking water and federal laws protecting drinking water
9. Identify acids and bases and simple acid base reactions
10. Comprehend the effect of acidic rain on materials, human health and surface water
11. Understand the source of energy from nuclear reactions
12. Discuss nuclear weapons, nuclear meltdowns and care of nuclear waste
13. Understand electron flow in batteries, fuel cells and solar cells
14. Identify the 6 most common recycled plastics and their impact on the environment
15. Accurately record and analyze data and use it to solve environmental problems

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. Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.

Goal 10 - People/Environment

1. Explain the basic structure and function of various natural ecosystems and of human adaptive strategies within those systems.
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

This course was previously CHEM 2522.