Common Course Outline
CHEM 150
Environmental Chemistry
3 Semester Hours

The Community College of Baltimore County

Description

Environmental Chemistry examines the chemical aspects of problems that human beings have created in the environment in connection with the natural processes in air, water, and soil. Topics included are stratospheric chemistry and the ozone depletion problem, acid rain, smog, asbestos, carbon monoxide, radioactivity from radon gas, the greenhouse effect and global warming, problems with pesticides, toxic heavy metals including lead and arsenic**.**

Prerequisites: 3 credits; 3 lecture hours; 0 laboratory hours required.
High School Chemistry; (ENGL 051 or LVE1)

Overall Course Objectives

Course Objectives:
Upon completion of this course, the student will be able to:

1. analyze the basic principles behind atmospheric chemistry;
2. investigate the problems and solutions to disturbances in atmospheric chemistry caused by release of chemicals into the atmosphere;
3. scrutinize the problems with the depletion of the stratospheric ozone layer and its possible effects on the weather;
4. analyze the international agreements on limiting the release of fluorocarbons [FREONS] and other OD's [ozone depletors] and describe the implications of these treaties;
5. explain energy use, carbon dioxide emissions, and their environmental consequences including global warming;
6. investigate ground level chemistry and air pollution including the origin and occurrence of smog;
7. explore the radon problem;
8. study some of the more toxic organic [carbon-based] chemicals and their effects including disruption of the endocrine system;
9. investigate the risk of certain pesticides including DDT and other organochlorine compounds; and
10. examine the history, case studies, and problems with the release of PCBs [polychlorinated biphenyls] in the Hudson River.

Major Topics

A. Introduction to Environmental Chemistry
   1. Toxic chemicals and the newborn
   2. Approaches to the prevention of pollution.

B. Air and Energy
1. Regions of the atmosphere
2. Chemistry of the ozone layer
3. The ozone hole and other sites of ozone depletion
4. Chemicals that cause ozone depletion.

C. Ground-Level air chemistry and air pollution.
1 Origin and occurrence of smog
2. Acid rain
3. Indoor air pollution

D. Greenhouse effect and global warming
1. Mechanism of the greenhouse effect
2. Major greenhouse gases

E. Energy use, carbon dioxide emissions
1. Potential consequences of global warming
2. Conventional and alternative fuels and their environmental consequences
3. Nuclear energy

F. Toxic substances
1. Pesticides
2. PCBs
3. PAHs

G. Toxic heavy metals
1. Mercury
2. Lead
3. Arsenic

H. Water
1. Nitrogen and phosphorus compounds in water – eutrophication

Course Requirements

Grading/Exams: Grading procedures will be determined by the individual faculty member teaching the course but will include the following:

1. minimum of two examinations.
2. Writing: term paper written on a topic on environmental interest.

Other Course Information

1. This course may be used to fulfill 3 credits in the physical sciences area of the general education requirements.
2. Individual faculty members may include additional course objectives/topics.

Individual faculty members may include additional course objectives, major topics, and other course requirements to the minimum expectations stated in the Common Course Outline.

OTHER COURSE INFORMATION

The Community College of Baltimore County is committed to providing a high-quality learning experience that

results in growth in knowledge, attitudes, and skills necessary to function successfully as a transfer student, in a career and as a citizen. To accomplish this goal, we maintain high academic standards and expect students to accept responsibility for their individual growth by attending classes, completing all homework and other assignments, participating in class activities and preparing for tests.

We take seriously our responsibility to maintain high-quality programs and will periodically ask you to participate in assessment activities to determine whether our students are attaining the knowledge, attitudes and skills appropriate to various courses and programs. The assessment activities may take many different forms such as surveys, standardized or faculty-developed tests, discussion groups or portfolio evaluations. We ask that you take these activities seriously so that we can obtain valid data to use for the continuous improvements of CCBC's course and programs.

Date Revised: 04/26/03