

ARIZONA WESTERN COLLEGE SYLLABUS

ENV 280 PHYSICAL AND CHEMICAL PROCESSES IN THE ENVIRONMENT Credit

Hours: 4 Lec 3 Lab 1

PREREQUISITES: ENV 230 and CHM 151

COREQUISITES: CHM 152 and MAT 270

COURSE DESCRIPTION

Introduction to the study of the Earth's atmosphere and hydrosphere, emphasizing composition, chemical processing, and physical transport, while addressing aspects of human impact and policy.

1. COURSE GOALS

- 1.1 Understand the importance of Earth's atmosphere with respect to the sustenance of life.
- 1.2 Have knowledge of predominant environmental contaminants in the United States. Become familiar with state and federal environmental policies and clean up procedures for these contaminants. Students may visit or be visited by a local organization or individual for discussion concerning such issues.
- 1.3 A working knowledge of issues involving commercial mid- and high-level nuclear waste programs in U.S. This includes readings and discussion on the proposed high-level nuclear waste site at Yucca Mountain, NV. We introduce and discuss the radio-chemical nature of the waste and the health hazards therein.
- 1.4 Understand the evidence for and against various atmospheric pollution problems.
- 1.5 Will become familiar with the groundwater/surface water/irrigation interactions.
- 1.6 Understand groundwater flow below a proposed landfill.

2. OUTCOMES

Upon satisfactory completion of this course, students will be able to:

- 2.1 describe the natural and anthropogenic sources of atmospheric pollution.
- 2.2 describe the physical and chemical process of earth's atmosphere.
- 2.3 demonstrate several atmospheric and water quality sampling techniques.
- 2.4 demonstrate calculating saturation indices using PHREEQC, a computer program for speciation, reaction-path, advective-transport, and inverse geochemical calculations.
- 2.5 model groundwater chemistry using SURFER, a visualization and contouring program for groundwater analyses, and Excel.
- 2.6 describe groundwater flow/pollution/pumping simulations using a 3-D model.

3. METHODS OF INSTRUCTION

- 3.1 Lecture
- 3.2 Audio visual presentations
- 3.3 Reviewing homework assignments and practice study problem
- 3.4 Classroom presentations by students
- 3.5 Experiments using live plants and animals
- 3.6 Guest speakers

4. LEARNING ACTIVITIES
 - 4.1 Lecture
 - 4.2 Audio visual presentations
 - 4.3 Assigned readings and study exercises
 - 4.4 Study groups
 - 4.5 Experiments with live animals and plants
 - 4.6 Classroom presentations
 - 4.7 Field trips

5. EVALUATION
 - 5.1 Exams
 - 5.2 Quizzes
 - 5.3 Presentations
 - 5.4 Research paper

6. STUDENT RESPONSIBILITIES
 - 6.1 Under AWC Policy, students are expected to attend every session of class in which they are enrolled.
 - 6.2 If a student is unable to attend the course or must drop the course for any reason, it will be the responsibility of the student to withdraw from the course. Students who are not attending as of the 45th day of the course may be withdrawn by the instructor. If the student does not withdraw from the course and fails to complete the requirements of the course, the student will receive a failing grade.
 - 6.3 Americans with Disabilities Act Accommodations: Arizona Western College provides academic accommodations to students with disabilities through AccessABILITY Resource Services (ARS). ARS provides reasonable and appropriate accommodations to students who have documented disabilities. It is the responsibility of the student to make the ARS Coordinator aware of the need for accommodations in the classroom prior to the beginning of the semester. Students should follow up with their instructors once the semester begins. To make an appointment call the ARS front desk at (928) 344-7674 or ARS Coordinator at (928) 344-7629, in the College Community Center (3C) building, next to Advising.
 - 6.4 Academic Integrity: Any student participating in acts of academic dishonesty—including, but not limited to, copying the work of other students, using unauthorized “crib notes”, plagiarism, stealing tests, or forging an instructor’s signature—will be subject to the procedures and consequences outlined in AWC’s Student Code of Conduct which may include withdrawal from the course or an F grade.
 - 6.5 Texts and Notebooks: Students are required to obtain the class materials for the course.
 - 6.6 Arizona Western College students are expected to attend every class session in which they are enrolled. To comply with Federal Financial Aid regulations (34 CFR 668.21), Arizona Western College (AWC) has established an Attendance Verification process for “No Show” reporting during the first 10 days of each semester.

Students who have enrolled but have never attended class may be issued a “No Show” (NS) grade by the professor or instructor and receive a final grade of “NS” on their official academic record. An NS grade may result in a student losing their federal financial aid.

For online classes, *student attendance in an online class is defined as the following* (FSA Handbook, 2012, 5-90):

 - Submitting an academic assignment
 - Taking an exam, an interactive tutorial or computer-assisted instruction
 - Attending a study group that is assigned by the school
 - Participating in an online discussion about academic matters
 - Initiating contact with a faculty member to ask a question about the academic subject studied in the course