

Global Change: Quantitatively examining the natural/physical world
PBIS-187-001C (3 credits)
SPRING 2006

Lecture Hours: 9:40 - 11:10 a.m. TuTh

Class Location: N. Halsey 456

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Office Hours: M, W, Fri 9:10 - 10:10
Tu, Th 1:50 -2:50
or by appointment

Tu 11:30-12:30, 4:10-5:10
W 9:10 - 12:30
Th 11:30-12:30
or by appointment

Required Text: The course modules have been compiled in a course packet that is available from the UW-O bookstore.

Additional materials will be posted to the course page in *Desire2Learn (D2L)* or sent to you by email. You must login to the D2L system. The easiest way to get into D2L is as follows:

- go to (<http://www.uwosh.edu/d2l>),
- follow the instructions on the login page.

About this Course:

This course fulfills the general education mathematics requirement as a Problem-Based Inquiry Seminar (PBIS). Both quantitative skills and problem-solving ability are increasingly important for any responsible citizen in our society. However, traditional general-education mathematics courses, such as algebra, have developed an unfortunate (but perhaps earned) reputation as being unappealing to liberal arts students, overly abstract and disconnected from the real world, and not necessarily focused on the quantitative skills most necessary for a citizen and liberal arts scholar. In order to address these concerns, UWO offers a variety of PBIS courses that emphasize critical thinking and active learning. In any PBIS course, students have the opportunity to

- improve their ability to reason logically,
- collect data, observe patterns, and make and verify conjectures,
- develop effective oral and written communication skills,
- improve skills related to critical thinking, problem solving and creativity,
- use and understand symbol systems and quantitative methods, and
- understand the principles of mathematics and the sciences.

(This list is quoted directly from the Math Department PBIS brochure.) Every PBIS course is organized around a series of problems, but the primary topic is not necessarily mathematics.

This particular course is a PBIS offering developed jointly by Dr. Maureen Muldoon from the Geology Department and Dr. Linda Eroh from the Mathematics Department. The problems for this course come from geology, the study of earth processes. Our problems, or modules, include making maps, analyzing sediment sizes, studying stream flow, predicting flood frequency, determining direction and velocity of groundwater flow, understanding rock density and how it affects the topography of the planet, creating and using a steady-state box model for a geological system (such as a watershed), and understanding climate change. Throughout the semester, you will gain some general background about these topics in geology, as well as a variety of quantitative skills. You will practice working with percentages, working with graphs, collecting data, understanding how an equation relates to the real-world situation that it

models, fitting curves to data, recognizing different types of functions, understanding and working with probability and statistics, representing a real-world situation with an equation, and manipulating an equation algebraically. All of these topical goals, however, are secondary to the goals of learning to solve problems and to use mathematics confidently and effectively.

Expectations:

The bulk of work in this course will consist of project-based assignments; there will be no formal exams although we will require you to take a pre- and post-test to assess logical thinking and problem-solving skills. For each module, there will be in-class group work as well as an individual final report.

Attendance in class is mandatory and we expect you to come to class prepared (i.e, read the module materials prior to the class starting the module and complete the background exercises) and to participate fully with your group. Groups will be assigned by the instructors. Two unexcused absences will result in a half grade reduction in your final course grade; four unexcused absences will result in a failing grade for the course.

Due dates for all assignments will be specified in the D2L course calendar and assignments must be completed on time. Late assignments will not be accepted without a valid, documented excuse.

This course will involve data collection labs. Some of these will be outdoors, some will be in Harrington. You need to pay attention to the schedule and show up in the right place and dressed appropriately. In addition, there will be one off campus field trip to a nearby stream. This trip is currently scheduled for Saturday March 25.

We received a UW-O Faculty Development grant to develop and co-teach this course and as part of the grant requirements we need to assess how students' logical thinking and problem-solving skills change over the course of the semester. We have developed a two-part pre-test that you need to complete during the first week of the semester. In early May, we will administer the post-test. Your scores on these tests will not be used to determine your grade in the class except in the following situation. If your score on either the pre-test or post-test (or both) is better than your grade on one of the project assignments, we will substitute the higher grade(s) before calculating your course grade. So basically these tests can only help, not hurt, your overall course grade.

Grading:

- 50% Project assignments (individual reports)
- 25% In-class exercises and assignments
- 20% Quizzes (unannounced)
- 5% Logic exercises

The final letter grade will be assigned according to the following table (although this scale may be adjusted if necessary).

<u>% of total possible points</u>	<u>Letter Grade</u>
92 - 100%	A
87 - 92	AB
82 - 87	B
77 - 82	BC
72 - 77	C
67 - 72	CD
62 - 67	D
<62	F

Extra Credit: There is no extra credit in this course.

Special Needs: Any students who need special accommodations for learning or who have special needs are invited to share these concerns or requests with the instructors as soon as possible.

Academic Dishonesty:

Academic dishonesty/cheating, in any form, will not be tolerated. All work submitted must be your own. Violations will result in a score of zero on the assignment and will be reported to the Dean of Students for further disciplinary action. See the *University of Wisconsin Oshkosh Student Discipline Code 2001-2002* for definitions of academic misconduct and details about procedures, sanctions, and other relevant information.

Tentative Course Schedule:

Dates	Topic
Jan 31	Introduction
Feb 1-3	Pre-test in Testing Center (Polk Library)
Feb 2 - 7	Sediment Analysis Module
Feb 9 - 16	Rock Density & Isostasy
Feb 21 - Mar 9	Climate Module
March 13 - 17	Spring Break
Mar 21 - Apr 4	Stream Module
April 6 - 20	Groundwater Module
Apr 26 - May 2	Map Making Module
May 3 - May 5	Post-test in Testing Center (Polk Library)
May 4 - 12	Water and Chemical Budgets