College of Science and Mathematics

Earth & Environmental Sciences

COURSE INFORMATION

Course Title
Global Change

Course Description (60 words max)
Global Change provides students with an introduction to Earth systems, using modules that are based on real world environmental events such as volcanic eruptions, hurricanes, and the impact of climate change on the earth system. An on-line laboratory component is included to allow students to build their knowledge of how scientists use real time data sets to gain scientific understandings of the Earth system.

Course Abbreviation and Number
EES 2150

Course Credit Hours
4 semester hours

Course Cross Listing(s) Abbreviation and Number
General Education Course X
Writing Intensive Course
Service Learning Course
Laboratory Course X
Ohio TAG (Transfer Assurance Guide) Course
Ohio Transfer Module Course X
Other

COURSE REGISTRATION

Prerequisites
None

Co-requisites
None

Restrictions
None

Other
STUDENT LEARNING OUTCOMES

This course will meet the learning outcomes of Element 6 of the Wright State Core, specifically to:

a. Understand the nature of scientific inquiry
b. Critically apply knowledge of scientific theory and methods of inquiry to evaluate information from a variety of sources
c. Distinguish between science and technology and recognize their roles in society
d. Demonstrate an awareness of theoretical, practical, creative and cultural dimensions of scientific inquiry
e. Discuss fundamental theories underlying modern science

Students in this course will be able to meet the learning outcomes above by being able to:

1) Understand how specific real world events impact the spheres (atmosphere, biosphere, hydrosphere and lithosphere) of the Earth system.
2) Explain how events impacting one sphere produce changes in other spheres of the Earth system.
3) Use real world data sets to prepare mathematical and basic statistical analyses to evaluate changes in the Earth system.
4) Evaluate the current controversies in climate change, including human impact on global climate change.
5) Describe the role of positive and negative feedback loops in the behavior of the Earth system.
6) Describe how the Earth system has changed through time and has shaped the physical and biological aspects of Planet Earth.

SUGGESTED COURSE MATERIALS

Although no text is required for the course, there are two suggested reference books that will be useful for student understanding. These are:


SUGGESTED METHOD OF INSTRUCTION

Lecture ____
Seminar ____
Distance Learning_____ *X
Web-Based  X ___
Other ______ *with an on-line laboratory component
SUGGESTED EVALUATION AND POLICY

The evaluation of student work is based on group products and individual laboratory reports and journal entries. All student work is guided by rubrics that focus on scientific writing, that is, accurate statements, deep explanations and quality of support. Instructor evaluation is based on exactly the same rubrics, so there is a complete correspondence between production of student work and its evaluation. The instructor reserves the right to assign different grades to individual group members for non-participation etc.

SUGGESTED GRADING POLICY

The final grade for EES2150 will be calculated in the following manner: the eight group Earth system science reports sphere and event studies are worth 75% of the overall grade, the lab exercises and journals are worth 25% of the overall grade. Final grades will be assigned letter grades based on the following scale:

90 – 100  A
80 – 89    B
70 – 79    C
60 – 69    D
Below 60  F

A grade of incomplete will be given only when prior arrangements have been made with the instructor in advance, given that there is reasonable expectation that the work will be made up within a reasonable amount of time.

SUGGESTED ASSIGNMENTS AND COURSE OUTLINE

The Earth System Science (ESS) modules below have been developed by the Earth System Science Education Alliance with support from the National Science Foundation, NASA and the National Oceanographic and Atmospheric Administration (NOAA) funding. The ESS modules are open source documents and are available at: http://esseacourses.strategies.org/

1  Ramp up to the course meet classmates on-line and complete on-line orientation.
2  Preliminary individual Earth system science analysis
3  Module 1 Yucatan Impact Sphere Study.
4  Module 1 Yucatan Impact Event Study.
5  Module 1 Yucatan Impact Individual Data Lab.
6. Module 2 Hurricane Katrina Sphere Study.
7. Module 2 Hurricane Katrina Event Study
8. Module 2 Hurricane Katrina Individual Data Lab
9. Module 3 Ice Shelves Sphere Study
10. Module 3 Ice Shelves Event Study
11. Module 3 Ice Shelves Individual Data Lab
12. Module 3 Ice Shelves Sphere Study
13. Module 4 Global Climate Change Sphere Study
14. Module 4 Global Climate Change Event Study
15. Module 4 Global Climate Change Individual Data Lab

**Lab Activities**

On-line lab activities are scheduled for each module. In lab, students will complete scientific inquiries, work with real world data sets, graphs, charts, maps and satellite data sets. These data will be used as evidence to support inductive scientific arguments and to identify and support scientific principles. Students will also discuss and critique their colleague’s arguments and use of evidence in on-line group discussions. Each lab exercise will be graded using the same rubric the student used to develop the assignment and will be worth a total of 25% of the overall grade for the course. All assignments are expected to adhere to appropriate grammar, spelling and technical terminology.