

**Eastern Illinois University  
Revised Course Proposal  
ESC/GEL 3010G, Environmental Physical Sciences**

**1. Catalog Description**

- a) ESC/GEL 3010G
- b) Environmental Physical Sciences
- c) (3-0-3)
- d) F, S, SU
- e) Env Phys Sci
- f) A study of physical environmental Earth processes and their interrelationship with human activities. This will include both the impact of the Earth on human communities and the impact of human communities on the Earth. Writing active.
- g) There are no prerequisites.
- h) Spring 2006

**2. Student Learning Objectives and Evaluation**

- a) Learning objectives- Students will:
  - describe fundamentals of the geosciences
  - interpret visual displays of data, including maps and air photos (critical thinking)
  - analyze data (critical thinking)
  - apply methods, techniques, and current theories of physical environmental scientists (global citizenship)
  - perform independent literature research and write on a topic (writing, critical thinking)
  - evaluate the dangers involved when humankind and the physical environment interact and recognize potential solutions to the problem (critical thinking, global citizenship)

b) Evaluation

Student performance will be evaluated based on:

homework	17 %
short quizzes	17 %
writing assignments	16 %
exams	50 %

The learning objectives will be evaluated using the following criteria:

<b>Evaluation Means</b>	<b>Writing Assignments</b>	<b>Quizzes</b>	<b>Homework</b>	<b>Exam</b>
<b>Objective</b>				
describe fundamentals of the geosciences	X	X	X	X
interpret visual displays of data, including maps and air photos (critical thinking)	X	X	X	X
analyze data (critical thinking)	X	X	X	X
apply methods, techniques, and current theories of physical environmental scientists (global citizenship)	X		X	
perform independent literature research and write on a topic (writing, critical thinking)	X			
evaluate the dangers involved when humankind and the physical environment interact and determine potential solutions to the problem (critical thinking, global citizenship)	X	X	X	X

- c) This will be a Technology Enhanced (TE) course. A multimedia computer system with projector is required in the classroom. Course materials such as lecture slides, vocabulary lists, and current grades are available to students on-line (WebCT). Students will take frequent, open book, open note, on-line quizzes (WebCT) with randomized selection of questions on each topic.
- d) Not applicable
- e) This will be a Writing Active (WA) course. There will be frequent writing assignments such as exam essays, homework essays, and writing assignments involving research in the physical environmental sciences.

### 3. Course Outline

- a) Class will meet 3 times each week for 15 weeks.  
(X) is equivalent to X\*50 minutes class time.
  - I. Global Environment (1)
    - A. Overview of geologic hazards
    - B. Scientific method
    - C. Effects of population increase
    - D. Historic problems with sustainable use of the earth
  - II. Earth materials and processes (7)
    - A. Minerals and rocks
    - B. Plate tectonics
    - C. Aerial photograph and map interpretation
  - III. Natural Hazards: An Overview (1)

- A. Types of natural hazards
- B. Cost in damages and lives

IV. Earthquake Hazards (3)

- A. Magnitude, frequency, distribution
- B. Primary and secondary effects
- C. Identification, prediction and protective measures

IV. Volcanic Hazards (3)

- A. Distribution and types
- B. Effects: past, present, future
- C. Prediction and protective measures

EXAM (1)

V. Mass Wasting Hazards (3)

- A. Types of mass wasting
- B. Causes of mass wasting (human and natural)
- D. Identification, prevention and protective measures

VI. Building Foundations and Subsidence (3)

- A. Design of building foundations
- B. Ground surface subsidence
- C. Expanding soil

VII. Coastal modifications (3)

- A. Coastal processes
- B. Man-made changes to coastline
- C. Effects of global warming

VIII. Stream Flooding (5)

- A. Stream processes
- B. Magnitude and frequency of floods
- C. Human impact on flooding
- D. Prediction, preventative and protective measures
- D. Man and the control of nature

EXAM (1)

IX. Water Resources (7)

- A. The hydrologic cycle
- B. Water supply and distribution
- C. Principles of groundwater hydrology
- D. Consequences of groundwater depletion
- E. U.S. Water Law
- F. Water pollution

- X. Waste Disposal (7)
  - A. Concepts of waste disposal: early views and modern trends
  - B. Types of waste, methods of disposal, and associated hazards
  - C. Landfill design
  - D. Recycling Programs
  - E. U.S. Environmental Law

## FINAL EXAM

### 5. Rationale

- a) This course is designed to meet the physical science criteria of the Scientific Awareness segment of the general education program. We affect and are affected by our physical environment. As humankind alters more of the physical environment we find natural geologic constraints over which we have no control. We must learn to recognize and adapt to these constraints. If humankind is to maintain a healthy environment, each of us must be able to recognize and address current environmental problems. We must be educated to anticipate constraints and avoid future negative impacts on the physical environment.
- b) This is a revision of an existing course at the 3000 level. The material is fast paced. The topics are selected to enhance the environmental awareness of the mature student interested in his/her world. There are no prerequisites required because course content is such that background knowledge is not necessary for success in the course.
- c) The topics of this course include mineral and rock identification, plate tectonics, and map interpretation skills. These are similar to those taught in ESC/GEL 1300G Earth Sciences but less time is allotted to them than in ESC/GEL 1300G. Once the basic techniques of geology and geography are learned, they are applied to topics of environmental physical science in subsequent material. The overlap between ESC/GEL 1300G and ESC/GEL 3010G is estimated to be less than 9 hours (3 weeks).

This is a modification of ESC/GEL 3010G and will maintain essentially the same curriculum. Changes include eliminating the laboratory component. Topics of building foundations, subsidence and coastal management will be added. These topics are related to how man interacts with and shapes his physical environment.
- d) ESC/GEL 3010G is a general education course. It is an elective for Geography majors and minors. It currently is required for Physics majors with an Applied Physics Option or with a Radiation Physics Option. It currently will partially fulfill the upper division general science requirement for Elementary Education: General Option majors.

### 6. Implementation

- a) Initial instructor: Geology/Geography staff
- b) Additional costs to students: \$5 approved course charge

c) Textbooks: Environmental Geology, 6<sup>th</sup> Edition, 2003 by Carla W. Montgomery

**7. Community College Transfer**

a) Not applicable

**8. Date approved by the Department** 10/01/04

**9. Date approved by the COS Curriculum Committee** 10/29/04

**10. Date approved by CAA** \_\_\_\_\_

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