1. **Catalog Description**

ESC/GEL 3010G. Environmental Physical Science. (2-2-3) F, S. Env Phys Sci. A study of environmental Earth processes and their interrelationship with human activities. This will include both the impact of the Earth on society and the impact of society on the Earth. Writing active.

2. **Student Learning Objectives**

   a. Students will:

   - participate in classroom discussion on environmental topics (speaking, critical thinking)
   - perform independent literature research and write a short paper (writing, critical thinking)
   - complete laboratory reports on environmental topics (writing, critical thinking)
   - solve laboratory problems involving real and fictional environmental hazards (critical thinking)
   - analyze data using basic mathematical skills (critical thinking)
   - interpret and create visual displays of data and other information (critical thinking)
   - learn the dangers involved when humankind and the environment interact and recognize potential solutions to the problem (critical thinking, citizenship)

   b. Students will:

   - learn the fundamentals of the geosciences
   - identify spatial relationships between landscapes and the underlying materials by map and air photo interpretation
   - identify rocks and minerals and learn the environmental effects of underlying geologic materials
   - learn methods, techniques, and current theories of environmental scientists

3. **Course Outline**

   (x) 50- Minute Lecture Periods  
   [x] 50-Minute Laboratory Periods

   I. Global Environment (1)  
      A. Overview of geologic hazards  
      B. Scientific method  
      C. Effects of population increase  
      D. Limits of global resources and land use
II. Earth materials and processes (6) [14]
   A. Minerals and rocks
   B. Plate tectonics
   C. Aerial photograph and topographic map use
   D. Interpreting geologic maps

III. Natural Hazards: An Overview (1)
   A. Cost in damages and lives

IV. Volcanic Hazards (3) [2]
   A. Distribution and types
   B. Effects: past, present, future
   C. Prediction and protective measures

V. Earthquake Hazards (3) [2]
   A. Magnitude, frequency, distribution
   B. Primary and secondary effects
   C. Recording, prediction and protective measures

EXAM (1)

VI. Stream Flooding (4) [4]
   A. Magnitude and frequency of floods
   B. Urbanization and flooding
   C. Nature and extent of flood hazard
   D. Prediction, preventative and protective measures
   E. Man and the control of nature

VII. Landslide Hazards (2) [2]
   A. Slope stability
   B. Causes of landslides (human & natural)
   C. Identification, prevention and protective measures

VIII. Water Resources (4) [4]
   A. The hydrologic cycle
   B. Water supply and distribution
   C. Principles of groundwater hydrology
   D. Groundwater mining and consequences
   E. U.S. Water Law
   F. Water pollution: Pathways of surface and groundwater

IX. Waste Disposal (5) [2]
   A. Concepts of waste disposal: early views and modern trends
   B. Types of waste disposal and associated hazards: solid, chemical, radioactive, septic tank, ocean dumping
   C. Landfill design
   D. Recycling Programs
   E. U.S. Environmental Law

EXAM (1)
4. **Evaluation of student learning**
   a. Students will be evaluated on the basis of performance on examinations (objective and/or essay), laboratory work, short frequent quizzes, and research paper.

   **Final Grade Components:**
   - Exams 40%
   - Labs 20%
   - Short quizzes 20%
   - Research paper 20%

   b. The course is writing active with assignments such as research papers and lab reports.

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 our physical environment we find natural physical constraints over which we have no control. We must learn to recognize and adapt to these constraints. Human population pressures have altered the global environment, making environmental problems social and political as well as physical in nature. 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 environment.

   b. The course is designed for upperclassmen that are aware of their own environment as well as the global environment. Many examples of environmental problems and hazards are discussed in class. The material is covered at a quick pace and requires excellent learning skills. There is no prerequisite to this course.

   c. The first laboratory exercises of this course cover mineral and rock identification and map interpretation skills. These exercises are similar to those taught in ESC/GEL 1300G, Earth Sciences. Once these basic techniques of geology and geography are covered, they are applied to environmental topics in subsequent laboratory exercises.

   ESC/GEL 3010G will replace ESC/GEL 3010C and ESC/GEL 3015C and should maintain the same curriculum i.d. as ESC/GEL3010C. Changes to the course are not substantial. The changes include combining ESC/GEL 3010C, the lecture component, and ESC/GEL 3015C, the laboratory component, into a single three-credit course.

   d. This course is an elective for Geology and Geography majors and minors.

6. **Implementation**
   a. Faculty member(s) to be initially assigned: Geology/Geography staff
   c. Additional costs to students: $5 approved course charge
   d. Term to be first offered: Spring 2001
7. **Community College Transfer** - Not Applicable

8. Date approved by the Department  2/18/2000

9. Date approved by the COS Curriculum Committee  3/24/2000

10. Date approved by CAA _____________

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