Eastern Illinois University
Revised Course Proposal

GEO 1300G, Introduction to Earth Sciences

1. Catalog Description

GEO 1300G. Introduction to Earth Sciences. (3-2-4) F, S, Su. Intro Earth Sci. An introduction to earth processes, resources, rocks, minerals, maps, time, and plate tectonics. The interaction of natural processes in the physical environment and human activity will be discussed. Lab work and field trip are required. Writing active. Grade and credit hours for this course will be removed if student already has credit for or is registered in GEO 1320G.

2. Student Learning Objectives

a. Students will:

- complete weekly lab reports which will include rock and mineral identification and explanation of landscapes and land-forming processes (writing, critical thinking)
- participate in class discussions on geoscience fundamentals using introduced scientific terms (speaking, critical thinking)
- apply the scientific method and general scientific concepts to laboratory assignments (writing, critical thinking)
- analyze data by applying basic mathematical skills (critical thinking)
- interpret visual displays of data and other geologic information (critical thinking)
- learn the relationship between the geosciences and socially responsible actions (critical thinking, citizenship)
- learn the interrelationships between developments in the earth, life and social sciences and the current state and future of the planet (critical thinking, citizenship)

b. Students will:

- learn the fundamentals of the geosciences
- identify the structure and occurrence of minerals and learn how these minerals are important in everyday life
- identify spatial relationships between landscapes and the underlying materials by map and air photo interpretation

3. Course Outline

(x) 50 minute lecture
[x] 50 minute lab

I. Introduction (1)
  A. Scientific method
    1. Plate tectonics
  B. Geologic time
    1. Relative age dating
    2. Radiometric ages

II. Earth composition and processes (14) [10]
- A. Minerals
  - 1. Chemical basis
  - 2. Types and properties
- B. Igneous rocks
- C. Volcanoes
  - 1. Types
  - 2. Location
  - 3. Consequences
- D. Weathering and erosion
- E. Sedimentary rocks
- F. Metamorphic rocks

EXAM (1)

III. Maps [6]
- A. Aerial photographs
- B. Topographic maps
  - 1. Grid systems
    - a. Latitude and longitude b. Township and range
  - 2. Scales
    - a. Relative fraction b. Verbal
    - c. Graphic
  - 3. Elevations
    - a. Drawing contour lines
    - b. Interpretation of contour lines
- C. Geologic map interpretation

IV. Atmospheric processes (1)
- A. Orographic effects
- B. Water cycle
- C. Climate
- D. Vegetation zones

EXAM (1)

V. Surficial processes (12) [6]
- A. Rivers
  - 1. River processes
  - 2. River features
- B. Glaciers
  - 1. Alpine glaciation
  - 2. Continental glaciation
- C. Groundwater
  - 1. Groundwater features
    - a. Hydrothermal features b. Karst topography
  - 2. Groundwater problems
- D. Deserts
  - 1. Desert features
  - 2. Wind erosion

E. Shorelines
1. Coastal erosion
2. Shoreline depositional features

EXAM (1) Field

Trip

VI. Plate tectonics (7) [6]
A. Historical development of plate tectonic theory
B. Modern plate tectonic theory
1. Diverging boundaries
2. Converging boundaries
3. Transform boundaries
C. Tectonic activity
1. Earthquakes
a. Recent and historical earthquakes b. Location of earthquakes
c. Classification of earthquakes
d. Consequences of earthquakes
D. Structural features
1. Faults
a. Nomenclature b. Types
2. Folding
a. Strike and dip b. Nomenclature

VII. Earth resources (6) [2]
A. Energy
1. Coal
2. Oil
3. Natural gas
B. Non-energy
1. Nonmetallic minerals
2. Strategic minerals
3. Economics of mineral deposits
C. Soil
1. Soil classification
2. Soil genesis
3. Locations of soil types

VIII. Geology of North America (1)
A. Major landforms
1. Nature of physiographic provinces
2. Spatial relationship of physiographic provinces
B. Geologic development of North America

FINAL EXAM

4. Evaluation of student learning

a. Evaluation of student learning objectives will be performed, for the most part, by using standard methods. Although it will vary by instructor, three lecture-based exams and one mineral and rock identification exam will be used to evaluate student comprehension of materials presented. Graded lab reports provide an opportunity for students and instructors to determine weekly progress on topics being covered. Group problem solving is a common activity and in some sections oral presentations

are an alternative evaluative tool used by the instructors. Student comprehension of examples presented on field trips allow instructors to determine the effectiveness of the lecture, laboratory and audio-visual materials presented in class.

b. As a writing-active course, the most frequent opportunity the students have to develop their writing skills is with laboratory reports. Labs are held weekly, with each lab requiring a written report. Geoscience problems and scenarios must be described, analyzed and explained in simple, discipline-specific terms. This process assists students in mastering course content, while at the same time strengthening their ability to produce scientific reports. Most of the instructors require short answer or short essay portions to their examinations. Student participation in field trips is summarized in journal form.

Final course grade components:

Lecture exams	66%
Lab reports	17%
Short quizzes	17%

5. Rationale
   a. This course is designed to meet the physical science criteria of the Scientific Awareness segment of the general education program. The course will provide students an opportunity to understand the scientific method through its application and experimentation in the laboratory and field settings using earth materials. Advances in the geosciences will be used as examples to illustrate the development and testing of hypotheses and experimental design. These same concepts will also be used to provide an opportunity to open discussions concerning the impact of science on society, philosophy, historical developments and trends, and the ethical use and misuse of scientific data knowledge.
   b. This is an introductory level course and has no prerequisites.
   c. GEO 1300G will replace ESC/GEL 1300C and should maintain same curriculum i.d. as ESC/GEL 1300C. The only substantial difference is to change the number of lecture hours to three per week and the course credit to four. This change is meant to reflect the depth of subject matter covered in the course.
   d. Approving this course will increase the requirement by one hour for the following majors and minors: majors in Geology and Geography, minors in Geology, Earth Science, Geography, minor in Earth Science with Teacher Certification and minor in Geography with Teacher certification.

   This course is required for the geology and geography majors, minor in geography for teacher certification, minor in earth science for teacher certification and minor in geology. It may also count in the geography minor.

6. Implementation
   a. Geology/Geography department staff will be assigned to teach this course.
   b. Text: Monroe, J.S. and Wicander, R., Physical Geology, Exploring the Earth, 3rd ed., 1998, Wadsworth Publishing Company, 646 p.
   Laboratory Manual: Freeman, T., Geoscience Laboratory, 2nd ed., 1996, John Wiley & Sons, Inc., 214 p.
   c. Additional costs to students: $4 approved course charge. This course may require that students pay a fee of approximately $25 to cover the cost of travel on geologic field trip(s).The account for field trips has been approved by the President Council.
   d. Term to be first offered: Spring 2001

7. Community College Transfer
A community college course may be judged equivalent to this course.

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

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

10. Date approved by the CAA 10/19/2000

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