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Course Outline for GEOL 5

ENVIRONMENTAL GEOLOGY: HAZARDS & DISASTERS

Effective: Fall 2017

I. CATALOG DESCRIPTION:
GEOL 5 — ENVIRONMENTAL GEOLOGY: HAZARDS & DISASTERS — 3.00 units

Understanding and planning for the effects of natural hazards and disasters on the earth, the ecosystem and human populations. Content covers the basic natural hazard processes, where and why they occur, as well as considerations for environmental land-use planning. Environmental hazards studied include earthquakes, volcanoes, river systems (including floods and dams), landslides, coastal erosion, tsunamis, sinkholes, etc.

3.00 Units Lecture

Grading Methods:
Letter or P/NP

Discipline:

	MIN
Lecture Hours:	54.00
Total Hours:	54.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

IV. MEASURABLE OBJECTIVES:

Upon completion of this course, the student should be able to:

A. In order to demonstrate a fundamental understanding: explain, discuss, analyze, identify and/or interpret of concepts, principles and interactions of Earth's systems including: the Hydrologic Cycle; the Rock Cycle; Plate Tectonics; Geologic Hazards; and Connectivity between geosphere, atmosphere, hydrosphere and biosphere.
B. Articulate (through written or verbal analysis, summaries, explanations, and/or discussions) how human activities impact the environment
C. Recognize and understand how to mitigate geologic hazards through verbal or written explanations, discussions, analysis, identifications, and/or interpretions.
D. Explain the Scientific Method
E. Communicate complex course concepts effectively in writing and diagrams through the analysis of laboratory exercises

V. CONTENT:
A. Formation of the Earth and Plate Tectonics
    1. Scientific Method
    2. Geologic Time and Earth History
    3. Plate Tectonics
    4. Geologic Structures
B. Earth Resources
    1. Rocks and Minerals
    2. Soils
    3. Water
        a. Human Impacts
        b. Exploitation and Use
        c. Population
        d. Waste
C. Earth Systems
    1. Rock Cycle
    2. Water Cycle
D. Geologic Hazards
    1. Mass Wasting
    2. Flooding and Drought
    3. Earthquakes
    4. Tsunamis
    5. Volcanoes
    6. Groundwater Quality and Subsidence
E. Optional Field Trip

VI. METHODS OF INSTRUCTION:

A. **Lecture** - when the course is offered in the traditional on-campus setting. When offered in the online, distance education, lecture material will be accessed through the textbook, online videos, online video clips, web pages on specific topics, etc
B. **Discussion** - e.g., through Class Discussion Boards and Class Wikis
C. **Audio-visual Activity** - videos and video clips on relevant course-related topics; includes online images and animations; online quizzes with images, etc.
D. **Student Presentations** - at the instructor's discretion. May be posted to Class Discussion Boards, Class Wikis, etc.
E. **Directed Study** - using the textbook with publisher materials as available (e.g., online flashcards, online animations, etc)
F. **Projects** - e.g., through Class Discussion Boards, Class Wikis, etc. For either Group or Individual projects, as determined by the instructor.
G. **Research** - e.g., for Group Projects and/or for term papers and/or for Discussion Board or Wiki projects.
H. **Classroom Activity** - e.g., through Class Discussion Boards and Class Wikis. etc.

VII. TYPICAL ASSIGNMENTS:

A. Construct a list of features to look for when attempting to determine the landslide potential of a hillside.

B. List and explain the best ways to build for earthquake-prone regions.

C. Read Chapters 1 thru 4. Look up the vocabulary words in these chapters and complete online Vocabulary Quiz 1. Use the textbook glossary and index, the Geologic Dictionaries available in the Science Center, and Internet search engines such as Google.

D. Memorize the Eons, Eras and Periods of the Geologic Time Scale

E. Complete the Study Guide questions for Exam 2.

F. Read Chapter 15 in the textbook.

- 1. Look up all vocabulary for this chapter.
- 2. Learn to identify the geomorphic features in this chapter in satellite images and regular aerial and ground photos.
- 3. Make sure that you understand the basic geologic processes discussed in this Chapter.
- 4. Complete the questions in the Study Guide that refer to the topics in this chapter.

G. Research Paper. Submit a 5-10 page 12-point paper on a geologic topic approved by the instructor.

H. Presentation. Create and present a 5-10 minute presentation on a geologic topic approved by the instructor.

VIII. EVALUATION:

A. **Methods**

1. Exams/Tests
2. Quizzes
3. Research Projects
4. Portfolios
5. Papers
6. Oral Presentation
7. Projects
8. Field Trips
9. Simulation
10. Group Projects
11. Class Participation
12. Class Work
13. Home Work

B. **Frequency**

1. Homework can be assigned daily, weekly or all at the beginning of the term or only as needed, at the discretion of the instructor
2. Quizzes can be given daily, weekly, bi-weekly or at the discretion of the instructor
3. Quizzes/Midterms/Final Exam/Term Paper – at least 3 or 4 total. For example, there may be 2 midterms, one final exam and one term paper. Or, there may be 4 on-line quizzes, 3 in-class midterms and one in-class final exam, or there may be weekly chapter quizzes.
4. Research Papers, Portolios, Papers, Oral Presentations, Projects, Field Trips, Simulations, Group Projects, Class Participation - at the instructor's discretion (could be one or more).

IX. TYPICAL TEXTS:

1. Keller, E. *Introduction to Environmental Geology – with CD*. 5th ed., Pearson Publishers, 2012.
2. Montgomery, Carla. *Environmental Geology*. 10th ed., WCB McGraw-Hill Publishers, 2014.
3. Pipkin, , Trent, Hazlett, and Bierman. *Geology and the Environment* . 7th ed., Brooks Cole, 2014.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

A. Access to the internet and computers, through the LPC Computer Center, a public library, or access to a personal computer at home with an internet connection
B. Study guides as made available by the instructor