

I. CATALOG DESCRIPTION:

- A. Division: Science
Department: Geology
Course ID: GEOL 100
Course Title: Physical Geology
Units: 4
Lecture: 3 hours
Laboratory: 3 hours
Prerequisite: None
Departmental Advisory: ENGL 015 or eligibility for ENGL 101 as determined through the SBVC Assessment process.

- B. Course Description:
An introduction to the study of the earth with emphasis on the materials that make up the earth; plate tectonics; the process that created the continents and the ocean basins; and the processes that change the landscape. Laboratory study is closely coordinated with the lecture.

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- II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: One**

III. EXPECTED OUTCOMES FOR STUDENTS:

Upon completion of the course, the student will be able to:

- A. describe the general internal structure of the earth
- B. understand the origin and significance of the three fundamental rock types,
- C. identify the major processes of erosion, mass wasting, and weathering,
- D. understand the reason for the ocean basins and contents and the process that continues to create new oceanic crust,
- E. describe the geologic nature of faults and folded structures and the processes that cause earthquakes,
- F. identify 30 common minerals through observable properties and know the general processes used to identify minerals,
- G. identify 30 common rocks and know the three classifications systems for rocks,
- H. interpret topographic maps and aerial photographs in order to recognize landscape features typical of major erosional and depositional processes,
- I. analyze evidence on geographic maps and cross-sections in order to restore the sequence of geologic events that led to the observable features.

ADVISORY ENTRANCE SKILLS:

Before attempting this class students should be able to:

- A. read actively, annotating and paraphrasing the text,
- B. summarize accurately,
- C. evaluate evidence for relevance to one's purpose,
- D. distinguish between facts, opinions, assumptions, and inferences,
- E. understand a common English vocabulary equivalent to a high school education,
- F. be able to assimilate a new technical vocabulary appropriate to the subject matter,
- G. organize information around a central idea,
- H. select and present relevant evidence to support a proposition,
- I. create a focused thesis statement, and
- J. write sentences free of gross grammatical errors.

IV. CONTENT

- A. The Third Planet
 - 1. Earth in Space: The Science of the Earth System
 - 2. Earth's Materials: Atoms, Elements, Minerals, and Rocks
 - 3. Earth in Time: The Rock Record and Geologic Time
- B. The Dynamic Earth
 - 1. Plate Tectonics: A Unifying Theory
 - 2. Earthquakes and the Earth's Interior
 - 3. From the Earth's Interior: Volcanoes and Igneous Rocks
- C. The Changing Earth
 - 1. Weathering and Erosion
 - 2. From Sediment to Rock: Rocks That Form Near the Earth's Surface
 - 3. Folds, Faults, and Geologic Maps
 - 4. Metamorphism: Making New Rock from Old
 - 5. The Rock Cycle Revisited
- D. Water World
 - 1. Water On and Under the Ground
 - 2. Oceans, Winds, Waves, and Coastlines
 - 3. Deserts, Glaciers, and Climatic Change
- E. Living On Planet Earth
 - 1. A Brief History of Life on Earth
 - 2. Earth Resources
 - 3. The Role of Geo-scientists in the 21st Century

V. METHODS OF INSTRUCTION:

- A. Lecture, including directed discussion, instructor-guided investigations, instructor-moderated problem solving sessions, and audio-visual aids-including computer-generated lecture outlines, supervised illustration of major features.
- B. Field trips in which students will be shown geologic features first hand, collect representative samples, perform field identifications, and assess the results of a variety of geologic processes.
- C. Laboratory work, including instructor-guided demonstrations of mineral and rock identification and classification processes, student-initiated identification and classification of rocks and minerals, interpretation of topographic maps, and analysis and interpretation of geologic maps and cross-sections.

VI. TYPICAL ASSIGNMENTS:

- A. Reading Assignments
 - 1. Selected assignments from the textbook and laboratory manual.
 - 2. Articles covering current events in geology (landslides, earthquakes, volcanic eruptions, floods) as well as long-term events (for example, natural resource depletion, environmental effects of mining and processing ores).
- B. Writing Assignments
 - 1. Selected chapter exercises from the textbook.
 - 2. Instructor-prepared exercises, especially those involving illustrations (maps, charts, diagrams, cross-sections) and their analysis.
 - 3. A journal to be kept when in the field.
 - 4. Laboratory reports including observations, drawings, conclusions, and answers to related questions.
 - 5. A written term project, either a research paper or a group project, showing synthesis of the concepts and processes covered in the course.

- C. Example
Choose one of the magazine or newspaper articles on the reading list and analyze the following:
1. Scientific accuracy
 2. Topic of study in this course
 3. What was reinforced as learned in this course
 4. What was new information for you
 5. Prepare a written summary and 3-5 minute class presentation.

VII. EVALUATION:

A. Methods of evaluation:

1. Written quizzes and/or tests of a variety of types of questions from among true-false, multiple choice, fill-in, sentence completion, and short essay.
2. Written exercises.
3. Written summaries of magazine or newspaper articles.
4. Laboratory assignments.
5. Performance in the field, including the journal.
6. Performance on the term project.

B. Frequency of evaluation:

1. Quizzes are given in lecture and/or lab, at weekly or monthly intervals.
2. Exams are given on a monthly basis, including a comprehensive final exam.
3. Exercises are assigned on a frequency to support comprehension of material, as deemed appropriate by the instructor.
4. Laboratory assignments are given weekly.
5. Typically, the class will take two field trips each semester.

C. Typical exam questions

1. List the four major subdivisions of the earth's interior.
2. In the list below, identify the minerals that have a hardness greater than glass.

| | |
|----------------|-------------|
| a. Plagioclase | f. Corundum |
| b. Kaolinite | g. Chlorite |
| c. Chalcedony | h. Garnet |
| d. Calcite | i. Gypsum |
| e. Hornblende | j. Fluorite |
3. Identify the minerals in the display set. Only a mineral name is required. Make certain that the mineral name is written in the space that has the same number as the mineral tray.
4. Given the indicated area on the geological map and accompanying cross-section at your table, reconstruct the sequence of geologic events representing the geologic history of the area.

VIII. TYPICAL TEXTS:

Plummer, McGeary, and Carlson, *Physical Geology*, 8th ed., WCB McGraw-Hill, 1999.

Murck and Skinner, *Geology Today, Understanding Our Planet*, 1st ed., John Wiley and Sons, 1999.

Chernicoff, *Essentials of Geology*, 2nd ed., Houghton Mifflin, 2000.

TYPICAL LABORATORY MANUALS

Zumbege, Rufford and Carter, *Laboratory Manual for Physical Geology*, 10th ed., WCB McGraw-Hill, 1999.

Woods, Karen, *Physical Geology Laboratory Manual*, 2nd ed., Kendall/Hunt, 1997.

Jones, Norris, *Laboratory Manual for Physical Geology*, 3rd ed., WCB McGraw-Hill, 2001.

IX. OTHER SUPPLIES REQUIRED OF STUDENTS:

- A. None.