

Las Positas College
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Course Outline for GEOL 1

PHYSICAL GEOLOGY

Effective: Fall 2017

I. CATALOG DESCRIPTION:

GEOL 1 — PHYSICAL GEOLOGY — 3.00 units

The Earth, its materials, its internal and external processes, and its development through time. Emphasis is placed on a thorough global understanding of Plate Tectonics as a framework and foundation for subsequent geologic topics and concepts. Topics include volcanoes, earthquakes and seismology, the Geologic Time Scale and the formation of the earth, rocks and minerals, hydrology, erosion, beach systems, environmental geology, glaciation, groundwater, etc. Course content includes the historical development of key geologic concepts. This is the foundation course for almost all subsequent geology courses for both geology majors and non-majors.

3.00 Units Lecture

Grading Methods:

Letter or P/NP

Discipline:

	<u>MIN</u>
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. Explain the scientific method
- B. In order to demonstrate conceptual understanding: explain, discuss, analyze, identify and/or interpret the fundamental concepts, principles, and interactions of Earth's systems applicable to the Geological Sciences.
- C. Apply, explain, discuss, analyze, identify and/or interpret the internal and external processes that shape and form the Earth.
- D. Apply, explain and/or discuss the rock cycle and identify and describe the basic properties of rocks and minerals.
- E. Explain, discuss, analyze, identify and/or interpret the fundamentals, and ramifications, of plate tectonics and Earth's resources.
- F. In order to demonstrate an understanding: explain, discuss, analyze, identify and/or interpret, how geological environments are formed, changed and eroded through geological time.
- G. Communicate complex course concepts effectively in writing and diagrams and apply critical thinking and problem solving skills to make informed decisions in life.

V. CONTENT:

- A. Introduction to Geology
 1. The Scientific Method
 2. History of Geology
- B. Earth Materials
 1. Minerals
 2. Igneous, Sedimentary and Metamorphic Rocks
 3. Soils
 4. Renewable and Non-Renewable Resources
 5. Metallogenic Provinces
- C. Geologic Time and Earth History
 1. Geologic Time
 2. Relative and Absolute Dating
 3. Fossils and Fossilization
- D. Earth's Internal Forces
 1. Plate Tectonics
 2. Earthquakes
 3. Volcanism and Igneous Rocks
 4. Mountain Building
 5. Geological Structures
 6. Metamorphism and Metamorphic Rocks
- E. Earth's External Processes
 1. Weathering, Mass Wasting and Erosion
 2. Sediment and Sedimentary Rocks

3. Surface Water Processes
4. Groundwater Processes
5. Oceans and Coastal Processes
6. Desert Processes
7. Glacial Processes

VI. METHODS OF INSTRUCTION:

- A. **Lecture** - may include powerpoint, videos, internet resources, student activities, group work, demonstrations, quizzes, research projects, field trips, class participation, class work, homework, class activities, etc.
- B. textbook, and students may use textbook publisher provided online and/or interactive materials; may include study guides, online recordings/explanations, etc.

VII. TYPICAL ASSIGNMENTS:

- A. 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.
- B. Memorize the Eons, Eras and Periods of the Geologic Time Scale
- C. Complete the Study Guide questions for Exam 2.
- D. Locate the following geologic features and learn how to find them on geomorphic maps. Yellowstone, The Grand Canyon, Hawaii, Midway, The Marianas Islands, Devil's Tower, Gui Lin, China, etc. Use the textbook, the maps in the textbook and the Internet – National Geographic Map Machine and Google Image searches.
- E. 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.
- F. Research Paper. Submit a 5-10 page 12-point paper on a geologic topic approved by the instructor.
- G. 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 will 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.
4. The comprehensive Final Exam will be given at the end of the semester on the day specified in the campus Final Exam schedule.
5. Research Papers, Portfolios, 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. Tarbuck, E., & Lutgens, F. (2017). *Earth, An Introduction to Physical Geology* (12th ed.). Upper Saddle River, New Jersey, New Jersey: Prentice-Hall Publishers.
2. Plummer, McGeary and Carlson, . (2016). *Physical Geology* (15th ed.). San Francisco, CA: McGraw-Hill Publishers.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

- A. Study guides if available
- B. Access to the internet and computers, through the LPC Computer Center, or access to a personal computer at home with an internet connection