

Lassen Community College Course Outline

GEOL-1 Physical Geology

4.0 Units

I. Catalog Description

Pursuit of understanding the physical classification of rocks and minerals of the earth as a whole and its past, present and future evolutionary processes. Unifying concepts such as plate tectonics and its implications, the magnitude of geologic time, uniformitarianism, and the ramifications of the fossil record will be explored. This course includes field trips to areas of geological interest. This course has been approved for online and hybrid delivery

Recommended Preparation: Successful completion of ENGL105 or equivalent multiple measures placement.

Transfers to both UC/CSU

General Education Area: A

CSU GE Area: B1 & B3

IGETC GE Area: 5A & 5C

C-ID GEOL 101

51 Hours Lecture, 51 Hours Lab, 102 Outside of Class Hours, 204 Total Student

Learning Hours

Scheduled: Fall

II. Coding Information

Repeatability: Not Repeatable, Take 1 Time

Grading Option: Graded or Pass/No Pass

Credit Type: Credit - Degree Applicable

TOP Code: 191400

III. Course Objectives

A. Course Student Learning Outcomes

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

1. Describe the unifying concepts of Geology.
2. Given a specific geological feature use the unifying concepts of Geology to explain the past, present, and future of the feature.

B. Course Objectives

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

1. Discuss physical geology.
2. Describe the major concepts of physical geology.
3. Describe why it is worthwhile to learn about physical geology such as petroleum, metals, etc.
4. Discuss the formation of natural resources.
5. Discuss the hydrologic cycle.
6. Explain the scientific method.
7. Differentiate between the continental crust and the ocean crust .
8. Discuss geologic time.

9. Survey principles of uniformitarianism and its importance to the development of geology.
10. Develop the rock cycle and explain what each portion of the cycle implies.
11. Discuss in general terms, what the theory on plate tectonics entails and the meaning of some of the terms associated with plate tectonics (such as spreading center, converging boundary, subduction).
12. Explain geologic processes
13. Describe the concept of equilibrium as it relates to geologic processes.
14. Demonstrate an ability to apply lecture knowledge to laboratory and field work in the areas of:
 - a. Rock and mineral identification and origins.
 - b. Interpretation of geologic information from field observation and classroom exercises using geologic materials; maps, photos, etc.
 - c. Interpretation of topographic maps
 - d. Interpretation of diagrams
 - e. Geologic processes including surface water, ground water, coastal, desert, and glacial

IV. Course Content

- A. The scope and substance of geology
 1. The Scientific Method
 2. History of Geology
- B. Minerals
- C. Vulcanism and extrusive rocks
- D. Intrusive activity and the origin of igneous rocks
- E. Weathering and soils
- F. Mass wasting and Erosion
- G. Sediments and sedimentary rocks
- H. Metamorphism, metamorphic rocks and hydrothermal rocks
- I. Geologic time
 1. Relative and Absolute Dating
 2. Fossils and Fossilization
- J. Surface water processes, Stream action and landscape development
- K. Ground water processes
- L. Glaciers and glaciation
- M. Desert Processes and landforms
- N. Oceans and Coastal Processes and landforms
- O. Structural geology
- P. Earthquakes
- Q. Introduction to geophysics-the earth's interior
- R. Vulcanism and Igneous Rocks
- S. The ocean basins
- T. Plate Tectonics
- U. Mountain belts and continental crust
- V. Geologic resources
 1. Renewable and Non-Renewable Resources
 2. Metallogenic Provinces
 3. Map and aerial photograph interpretation

Laboratory Content

Through laboratory and field trips the following content will be covered:

- A. Topographic maps
- B. Mineral identification
- C. Relative and absolute dating
- D. Geologic time
- E. Plate Tectonics
- F. Earthquakes
- G. Volcanoes
- H. Rock identification
- I. Geologic structures
- J. Geological maps and cross sections
- K. Surface water processes
- L. Ground water processes
- M. Coastal processes
- N. Desert processes
- O. Glacial processes

V. Assignments

A. Appropriate Readings

Text, periodicals, and monographs will be assigned for outside readings and class discussions.

B. Writing Assignments

1. Students should be able to write descriptions of the geologic processes described, as well as summarize the major geologic theories discussed.
2. Students will complete lab reports and activities

C. Expected Outside Assignments

1. Continuous textbook assignments, newspaper and professional journal reviews as assigned.
2. Written reports applying principles learned to particular topics, situation, or events.
3. Local field trips to areas of geological significance.

D. Specific Assignments that Demonstrate Critical Thinking

In order to successfully complete this course, students must utilize information presented during lecture to formulate a course of action designed to allow the student to:

1. Arrive at the correct identity of 30 unknown rock and mineral samples.
2. Analyze and describe photograph, rendering, or observed land forms and the process that created them.
3. Analyze a topographic map and identify geologic features Students will investigate and synthesize information on an appropriate geologic subject and formulate this information into an approved project. In addition, the essay component of unit exams is designed to challenge student to analyze and synthesize information.

VI. Methods of Evaluation

Traditional Classroom Evaluation:

- A. Four semester exams and a comprehensive final required.
- B. Chapter quizzes will be given periodically.

- C. Written reports on assigned topics for extra credit.
- D. Regular laboratory participation.

Online Evaluation:

A variety of methods will be used, such as: research papers, asynchronous and synchronous discussions (chat/forum), online quizzes and exams, postings to online website, and email communications.

Hybrid Evaluation:

All quizzes and exams will be administered during the in person class time. Students will be expected to complete online assignments and activities equivalent to in class assignments and activities for the online portion of the course. Electronic communication, both synchronous and asynchronous will be evaluated for participation and to maintain effective communication between instructor and students.

VII. Methods of Delivery

Check those delivery methods for which, this course has been separately approved by the Curriculum/Academic Standards Committee.

Traditional Classroom Delivery Correspondence Delivery

Hybrid Delivery

Online Delivery

Traditional Classroom Delivery:

Lecture, discussion, slides, films-multimedia. Outside lecturers and local field trips may also be used.

Online Delivery:

Online written lectures. Participation in forum-based discussions. Online exercises/assignments contained on website. Discussion papers, email communications, postings to forums, and web-links will comprise the method of instruction.

Hybrid Delivery:

A combination of traditional classroom and online instruction will be utilized. Each semester 51 lab hours will be taught face-to face by the instructor and 51 lecture hours will be instructed online through the technology platform adopted by the District. Traditional class instruction will consist of lectures, visual aids, and group presentations. Online delivery will consist of exercises/assignments, lecture posts, discussions, adding extra resources and other media sources as appropriate.

VIII. Representative Texts and Supplies

Marshak, Stephen; *Essentials of Geology*, 7th edition, 2022, W.W. Norton Company, ISBN-13 9780393882735 (ISBN-10 039388273X)

Busch, *Laboratory Manual in Physical Geology*, 12th edition, 2020, Pearson, ISBN-13: 9780135836972 (ISBN-10 0135836971)

IX. Discipline/s Assignment

Earth Science

X. Course Status

Current Status: Active

Original Approval Date: 6/1/1990

Revised By: Lynn Fuller

Curriculum/Academic Standards Committee Revision Date: 02/21/2023