



El Camino College
COURSE OUTLINE OF RECORD – Approved

I. GENERAL COURSE INFORMATION

Subject and Number: Geology 1
Descriptive Title: Physical Geology
Course Disciplines: Earth Science
Division: Natural Sciences

Catalog Description:

This course provides an introduction to geology, including the scientific method and the history of geology. It examines the materials, structures, and processes that compose and shape the Earth. It includes a survey of minerals, rocks, and soils; a study of plate tectonics and the forces that create volcanoes, earthquakes, and mountains; and a study of surface features due to weathering and erosion, streams, mass wasting, ground water, glaciers, wind, desert processes, and ocean waves. The course examines concepts of geologic time, relative and absolute age dating, and fossils. The course also investigates renewable and non-renewable resources as well as mining provinces that produce metals important for industry and technology.

Note: 1 unit of laboratory science credit will be granted with concurrent or subsequent enrollment in a geology laboratory course.

Conditions of Enrollment:

Recommended Preparation: English 1 or eligibility for English 1A or qualification by appropriate assessment

Course Length:	X Full Term	Other (Specify number of weeks):
Hours Lecture:	3.00 hours per week	TBA
Hours Laboratory:	0 hours per week	TBA
Course Units:	3.00	

Grading Method: Letter
Credit Status: Associate Degree Credit

Transfer CSU: X Effective Date: Prior to July 1992
Transfer UC: X Effective Date: Prior to July 1992

General Education: El Camino College:

1 – Natural Sciences
 Term: Other: Approved

CSU GE:

B1 - Physical Science
 Term: Other: Approved

IGETC:

5A - Physical Science without Lab
 Term: Fall 1991 Other:

II. OUTCOMES AND OBJECTIVES

A. COURSE STUDENT LEARNING OUTCOMES (The course student learning outcomes are listed below, along with a representative assessment method for each. Student learning outcomes are not subject to review, revision or approval by the College Curriculum Committee)

1. Students recognize and can accurately articulate how the Earth affects humans' lives and how human activities affect the Earth.
2. Students can identify the salient features of the basic concepts of geology. (This includes the ability to recall the definitions of the specialized vocabulary of geology.)
3. Students can identify the key elements of the scientific method (hypotheses, tests, observations, conclusions/interpretation of observations) in popular accounts of scientific research in magazines, newspapers, etc.

The above SLOs were the most recent available SLOs at the time of course review. For the most current SLO statements, visit the El Camino College SLO webpage at <http://www.elcamino.edu/academics/slo/>.

B. Course Student Learning Objectives (The major learning objective for students enrolled in this course are listed below, along with a representative assessment method for each)

1. Relate the characteristics and nature of the common rock-forming minerals and rocks to the processes that formed them.
 - Quizzes
2. Describe the processes, hazards, and results of igneous activity.
 - Essay exams
3. Compare and contrast the methods used to determine the age of the earth, the geologic time scale, and methods of dating rocks.
 - Essay exams
4. Correlate the formation of earthquake waves with faults and plate tectonic forces.
 - Homework Problems
5. Relate the theory of plate tectonics to volcanism, earthquakes, mountain building, and other geologic processes.
 - Multiple Choice
6. Summarize the different kinds of folds, faults, and unconformities and assess the forces that led to their formation in the context of plate tectonics theory.
 - Quizzes
7. Explain the consequences of mass movements as related to human activities.
 - Written homework
8. Describe the processes of weathering and erosion of rocks, including methods by which streams, groundwater, glaciers, wind, and ocean waves shape the surface.
 - Essay exams
9. Students recognize and articulate how the Earth affects the lives of humans and how human activities affect the Earth.
 - Quizzes

III. OUTLINE OF SUBJECT MATTER (Topics are detailed enough to enable a qualified instructor to determine the major areas that should be covered as well as ensure consistency from instructor to instructor and semester to semester.)

Lecture or Lab	Approximate Hours	Topic Number	Major Topic
Lecture	6	I	Introduction to Physical Geology A. The scientific method B. History of geology C. Principle of Uniformitarianism D. Earth materials and the rock cycle E. Plate tectonics F. Origin of the Earth and Moon G. Evidence for plate boundaries H. Types of plate boundaries
Lecture	3	II	Matter and Minerals A. Particles of matter and atomic structure B. Bonding C. Physical properties of minerals D. Classification and association of minerals
Lecture	3	III	Origin and Occurrence of Intrusive and Volcanic Igneous Rocks A. Formation, texture, and classification of igneous rocks B. Origin of magmas C. Types of intrusive and volcanic igneous rocks D. Products of volcanism E. Types of volcanoes, plate tectonics, and their distribution
Lecture	3	IV	Erosion, Weathering and Soils A. Types of weathering B. Rates of weathering and erosion C. Nature and formation of soils
Lecture	3	V	Sediment and Sedimentary Rocks A. Formation of sediment and sedimentary rocks B. Types and classification of sedimentary rocks C. Features of sedimentary rocks D. Depositional environments of sediments
Lecture	3	VI	Metamorphic Rocks A. Metamorphic processes B. Types of metamorphism C. Classification of metamorphic rocks D. Relationship to plate boundaries
Lecture	3	VII	Geologic Time A. Principles of relative age dating B. Principles of absolute age dating C. Geologic time scale D. Important aspects of fossils and fossilization

Lecture	3	VIII	<p>Deformation of Rocks and Mountains</p> <ul style="list-style-type: none"> A. Stress, strain, and strength of rocks B. Folds and faults C. Structural features D. Major fault zones of California E. Isostasy F. Nature and origin of mountain chains G. Processes of mountain building H. Relationship of mountains to plate tectonics
Lecture	3	IX	<p>Earthquakes and the Earth's Interior</p> <ul style="list-style-type: none"> A. Nature of earthquake waves B. Records of earthquake waves C. Interpreting earthquakes D. Causes of earthquakes and relationship to plate tectonics E. Earthquake forecasting F. Structure and composition of the Earth's interior
Lecture	3	X	<p>Continental Drift and Plate Tectonics</p> <ul style="list-style-type: none"> A. Theory of continental drift, fossils, and glacial deposits B. Paleomagnetism and age of seafloor C. Sea-floor spreading D. Types of plate boundaries and rocks
Lecture	3	XI	<p>Mass Wasting</p> <ul style="list-style-type: none"> A. Factors that influence mass movements B. Slow movements C. Movements of moderate velocity D. Rapid movements
Lecture	3	XII	<p>Surface Water and the Processes of Erosion</p> <ul style="list-style-type: none"> A. Hydrologic cycle B. Stream flow C. Economy of a stream D. Erosion due to streams E. Landscape features of streams F. Floods and their mitigation G. Flood Hazards
Lecture	3	XIII	<p>Groundwater</p> <ul style="list-style-type: none"> A. Distribution and movement B. Wells, springs, and geysers C. Erosion by groundwater D. Problems caused by human use and pollution
Lecture	3	XIV	<p>Glacial Processes</p> <ul style="list-style-type: none"> A. Classification and distribution of glaciers B. Nourishment, wastage, and movement C. Erosion due to glaciers D. Origin of glaciers and climate change E. Ice ages and Milankovitch Theory

Lecture	3	XV	Desert Processes and Wind A. Distribution of deserts B. Erosion due to wind C. Features produced by wind and other desert processes
Lecture	3	XVI	Oceans and Coastal Processes A. Currents and waves B. Bathymetry of the sea floor C. Sediments on the sea floor D. Coastal shoreline features and longshore drift
Lecture	3	XVII	Earth Resources A. Renewable resources B. Non-renewable resources C. Metal-producing geologic provinces and mining
Total Lecture Hours		54	
Total Laboratory Hours		0	
Total Hours		54	

IV. PRIMARY METHOD OF EVALUATION AND SAMPLE ASSIGNMENTS

A. PRIMARY METHOD OF EVALUATION:

Substantial writing assignments

B. TYPICAL ASSIGNMENT USING PRIMARY METHOD OF EVALUATION:

In a one page essay, discuss the evidence that supports the hypothesis that the continents were combined together in one large, super continent in the past.

C. COLLEGE-LEVEL CRITICAL THINKING ASSIGNMENTS:

1. In a one paragraph essay, explain why earthquake epicenters and active volcanic cones are located in overlapping linear belts.
2. In a one paragraph essay, discuss why landslides are relatively common in Southern California as compared with the rest of the United States.

D. OTHER TYPICAL ASSESSMENT AND EVALUATION METHODS:

Essay exams
Quizzes
Written homework
Homework Problems
Term or other papers
Multiple Choice
Matching Items
True/False
Presentation

V. INSTRUCTIONAL METHODS

Demonstration
Discussion
Field trips
Group Activities
Lecture
Multimedia presentations
Online through LMS
Specimens, maps, and review sessions

Note: In compliance with Board Policies 1600 and 3410, Title 5 California Code of Regulations, the Rehabilitation Act of 1973, and Sections 504 and 508 of the Americans with Disabilities Act, instruction delivery shall provide access, full inclusion, and effective communication for students with disabilities.

VI. WORK OUTSIDE OF CLASS

Study
Answer questions
Required reading
Problem solving activities
Written work

Estimated Independent Study Hours per Week: 6

VII. TEXTS AND MATERIALS

A. UP-TO-DATE REPRESENTATIVE TEXTBOOKS

Lutgens, F.K. and Tarbuck, E.J. Essentials of Geology. Custom ed. Prentice Hall Publishing, 2018.
Online Geology textbook UBC: <https://opentextbc.ca/geology/>

B. ALTERNATIVE TEXTBOOKS

Herzig, C.T., Geology 1 Lecture Notes and Workbook, version 3.5, El Camino College, 2019.

C. REQUIRED SUPPLEMENTARY READINGS

D. OTHER REQUIRED MATERIALS

VIII. CONDITIONS OF ENROLLMENT

A. Requisites (Course and Non-Course Prerequisites and Corequisites)

Requisites	Category and Justification
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B. Requisite Skills

Requisite Skills

C. Recommended Preparations (Course and Non-Course)

Recommended Preparation	Category and Justification
English 1	Category: Course Justification: This course involves reading college level textbooks, developing written projects, and answering essay questions. A student’s success in this class will be enhanced if they have these skills.
Eligibility for English 1A or qualification by appropriate assessment	Category : Non-Course Justification: This course involves reading college level textbooks, developing projects, and answering essay questions. A student’s success in this class will be enhanced if they have these skills.

D. Recommended Skills

<p>Students in this course are required to use critical thinking skills to read college-level textbooks. The skills developed in English 1 will increase their ability to complete these assignments and will greatly enhance their chances for success in this course.</p> <p>ENGL 1- Summarize, analyze, evaluate, and synthesize college-level texts.</p> <p>ENGL 1 - Write a well-reasoned, well-supported expository essay that demonstrates application of the academic writing process.</p>
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E. Enrollment Limitations

Enrollment Limitations and Category	Enrollment Limitations Impact
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Course created by W. Ford, J. Baldwin, and B. Pipkin on 02/01/1962.

BOARD APPROVAL DATE:

LAST BOARD APPROVAL DATE: 01/20/2020

Last Reviewed and/or Revised by Chuck Herzig
18608

Date: 9/28/2019