



El Camino College
COURSE OUTLINE OF RECORD – Official

Course Acronym:	GEOL
Course Number:	1
Descriptive Title:	Physical Geology
Division:	Natural Sciences
Department:	Geology
Course Disciplines:	Earth Science
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.
Prerequisite:	
Co-requisite:	
Recommended Preparation:	Eligibility for ENGL C1000 or equivalent
Enrollment Limitation:	
Hours Lecture (per week):	3
Hours Laboratory (per week):	0
Outside Study Hours:	6
Total Course Hours:	54
Course Units:	3
Grading Method:	Letter Grade only
Credit Status:	Credit, degree applicable
Transfer CSU:	Yes
Effective Date:	Prior to July 1992
Transfer UC:	Yes
Effective Date:	prior to fall 1992

General Education: ECC	Area 1 - Natural Sciences
Term:	
Other:	
CSU GE:	Area B1 - Physical Universe and its Life Forms: Physical Science
Term:	
Other:	
IGETC:	Area 5A - Physical Science
Term:	
Other:	
CalGETC:	
Term:	
Other:	
Student Learning Outcomes:	SLO #1 Basic Knowledge Students recognize and can accurately articulate how the Earth affects humans' lives and how human activities affect the Earth. SLO #2 Relationship with Their Environment 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. SLO #3 Nature of Science 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.
Course Objectives:	1. Relate the characteristics and nature of the common rock-forming minerals and rocks to the processes that formed them. 2. Describe the processes, hazards, and results of igneous activity. 3. Compare and contrast the methods used to determine the age of the earth, the geologic time scale, and methods of dating rocks. 4. Correlate the formation of earthquake waves with faults and plate tectonic forces. 5. Relate the theory of plate tectonics to volcanism, earthquakes, mountain building, and other geologic processes. 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. 7. Explain the consequences of mass movements as related to human activities.

	8. Describe the processes of weathering and erosion of rocks, including methods by which streams, groundwater, glaciers, wind, and ocean waves shape the surface. 9. Students recognize and articulate how the Earth affects the lives of humans and how human activities affect the Earth.
Major Topics:	I. Introduction to Physical Geology (6 hours, lecture) 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 II. Matter and Minerals (3 hours, lecture) A. Particles of matter and atomic structure B. Bonding C. Physical properties of minerals D. Classification and association of minerals III. Origin and Occurrence of Intrusive and Volcanic Igneous Rocks (3 hours, lecture) 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 IV. Erosion, Weathering and Soils (3 hours, lecture) A. Types of weathering B. Rates of weathering and erosion C. Nature and formation of soils V. Sediment and Sedimentary Rocks (3 hours, lecture) A. Formation of sediment and sedimentary rocks B. Types and classification of sedimentary rocks C. Features of sedimentary rocks D. Depositional environments of sediments VI. Metamorphic Rocks (3 hours, lecture) A. Metamorphic processes B. Types of metamorphism C. Classification of metamorphic rocks D. Relationship to plate boundaries

VII. Geologic Time (3 hours, lecture)

- A. Principles of relative age dating
- B. Principles of absolute age dating
- C. Geologic time scale
- D. Important aspects of fossils and fossilization

VIII. Deformation of Rocks and Mountains (3 hours, lecture)

- 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

IX. Earthquakes and the Earth's Interior (3 hours, lecture)

- 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

X. Continental Drift and Plate Tectonics (3 hours, lecture)

- 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

XI. Mass Wasting (3 hours, lecture)

- A. Factors that influence mass movements
- B. Slow movements
- C. Movements of moderate velocity
- D. Rapid movements

XII. Surface Water and the Processes of Erosion (3 hours, lecture)

- 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

	XIII. Groundwater (3 hours, lecture) A. Distribution and movement B. Wells, springs, and geysers C. Erosion by groundwater D. Problems caused by human use and pollution XIV. Glacial Processes (3 hours, lecture) 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 XV. Desert Processes and Wind (3 hours, lecture) A. Distribution of deserts B. Erosion due to wind C. Features produced by wind and other desert processes XVI. Oceans and Coastal Processes (3 hours, lecture) A. Currents and waves B. Bathymetry of the sea floor C. Sediments on the sea floor D. Coastal shoreline features and longshore drift XVII. Earth Resources (3 hours, lecture) 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
A.1. Primary Methods of Evaluation (Part 1 - CCN courses only):	
A.2. Primary Method of Evaluation (Part 2 - all courses; choose one):	
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.

Critical Thinking Assignment 1:	In a one paragraph essay, explain why earthquake epicenters and active volcanic cones are located in overlapping linear belts.
Critical Thinking Assignment 2:	In a one paragraph essay, discuss why landslides are relatively common in Southern California as compared with the rest of the United States.
Other Evaluation Methods:	Essay Exams, Homework Problems, Matching Items, Multiple Choice, Presentation, Quizzes, Term or Other Papers, True/False, Written Homework
Instructional Methods:	Demonstration, Discussion, Field trips, Group Activities, Lecture, Multimedia presentations
If other:	Online through LMS Specimens, maps, and review sessions
Work Outside of Class:	Answer questions, Problem solving activity, Required reading, Study, Written work (such as essay/composition/report/analysis/research)
If Other:	
Up-To-Date Representative Texts:	Lutgens, Tarbuck, Tasa. <i>Essentials of Geology</i> . 13th Edition. Pearson, 2018. (Discipline Standard) Online Geology textbook UBC: https://opentextbc.ca/geology/)
Alternative Texts:	
Required Supplementary Readings:	
Other Required Materials:	
Requisite:	
Category:	
Requisite course(s): List both prerequisites and corequisites in this box.	
Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).	
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Requisite and Matching skill(s): Bold the requisite skill. List the corresponding	

course objective under each skill(s).	
Requisite Skill:	Eligibility for ENGL C1000 or equivalent
Requisite Skill and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s). If applicable	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. Students in this course are required to use critical thinking skills to read college-level textbooks. The skills developed in English C1000 will increase their ability to complete these assignments and will greatly enhance their chances for success in this course. Summarize, analyze, evaluate, and synthesize college-level texts. Write a well-reasoned, well-supported expository essay that demonstrates application of the academic writing process.
Enrollment Limitations and Category:	
Enrollment Limitations Impact:	
Course Created by:	W. Ford, J. Baldwin, and B. Pipkin
Date:	02/01/1962
Original Board Approval Date:	
Last Reviewed and/or Revised by:	Eduardo Ayala
Date:	11/10/2025
Last Board Approval Date:	01/21/2026
Effective Term:	FA 2026