



El Camino College
COURSE OUTLINE OF RECORD – Official

Course Acronym:	GEOL
Course Number:	3
Descriptive Title:	Physical Geology Laboratory
Division:	Natural Sciences
Department:	Geology
Course Disciplines:	Earth Science
Catalog Description:	This course is a laboratory study of geologic exercises and the use of topographic maps. Laboratory exercises will include identification of rocks and minerals, map exercises, structure problems, field studies and recognition of landforms created by various processes working on and in the earth.
Prerequisite:	Geology 1 with a minimum grade of C or concurrent enrollment
Co-requisite:	
Recommended Preparation:	
Enrollment Limitation:	
Hours Lecture (per week):	0
Hours Laboratory (per week):	3
Outside Study Hours:	0
Total Course Hours:	54
Course Units:	1
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, Area B3 - Physical Universe and its Life Forms: Laborator Activity
Term:	

	Other:	
	IGETC:	Area 5A - Physical Science
	Term:	
	Other:	
	CalGETC:	
	Term:	
	Other:	
Student Learning Outcomes:	SLO #1 Basic Knowledge 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 #2 Relationship with Their Environment Students recognize and can accurately articulate how the Earth affects humans' lives and how human activities affect the Earth. 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. Identify the major rock-forming minerals and commonly occurring igneous, sedimentary and metamorphic rocks. 2. Recognize and identify structural features such as folds, faults and unconformities; interpret structural problems. 3. Determine age relationships from relative and absolute dating methods. 4. Recognize the name and origin of geomorphic features using topographic maps and aerial photos.	
Major Topics:	I. Plate Tectonics(6 hours, lab) A. Identify different plates B. Three major plate boundaries C. California tectonics II. Seismicity (3 hours, lab) A. Cause of earthquakes B. Types of seismic waves C. Locating epicenters D. Southern California faults and quake III. Structural Geology (3 hours, lab) A. Distribution and orientation of rock units B. Folds 1. Types 2. Nomenclature 3. Outcrop patterns	

- C. Faults
 - 1. Types
 - 2. Nomenclature
 - 3. Outcrop patterns
- IV. **Geologic Time (3 hour, lab)**
 - A. Unconformities
 - 1. Origin
 - 2. Types
 - 3. Outcrop patterns
 - B. Recognition and interpretation of geologic structures
 - 1. Topographic expression
 - 2. Interpretation
- V. **Minerals (3 hours, lab)**
 - A. Mineral chemistry
 - B. Crystalline structures
 - C. Chemical composition
 - D. Physical properties
 - E. Mineral identification
- VI. **Igneous Rocks (3 hours, lab)**
 - A. Texture
 - B. Mineralogic composition
 - C. Crystallization of magmas
 - D. Classification
 - E. Intrusive and extrusive
 - F. Identification
- VII. **Sedimentary Rocks (3 hours, lab)**
 - A. Environments of sedimentation
 - B. Classification of clastic sedimentary rocks
 - C. Chemical sedimentary rocks
 - D. Bioclastic and biochemical sedimentary rocks
 - E. Identification
- VIII. **Metamorphic (3 hours, lab)**
 - A. Metamorphic process
 - B. Types of metamorphism
 - C. Mineralogy and chemical composition
 - D. Conditions of metamorphism
 - E. Classification (foliated and non-foliated)
 - F. Identification
- IX. **Field Study (3 hours, lab)**
 - A. Local area to observe different rock types
- X. **Topographic Maps and Aerial Photographs (3 hours, lab)**
 - A. Scale
 - B. Location
 - C. Contour lines
 - D. Elevation, relief, height

	E. Gradients F. Profiles
XI.	Streams (3 hours, lab) A. Stream patterns and differential erosion 1. Drainage density and patterns 2. Differential erosion 3. Superposition B. Erosion and deposition by streams 1. Stages of river development 2. Depositional features 3. Stream capture C. Evolution of landscape in humid climates 1. External drainage 2. Erosional processes 3. Evolution of landscape
XII.	Field Study (3 hours, lab)
XIII.	A. Local area to observe geologic hazards and structural geology Ground Water (3 hours, lab) A. Aquifers B. Ground water erosion C. Water table D. Karst topography
XIV.	Desert Geomorphology (3 hours, lab) A. Features 1. Alluvial fans 2. Pediments 3. Canyons 4. Playas B. Wind Landforms 1. Mechanism of sand transport 2. Deposition of sand 3. Types of dunes
XV.	Glacial Landforms (3 hours, lab) A. Alpine glaciation, erosional landforms, and depositional landforms B. Continental glaciers, erosional, depositional
XVI.	Shoreline Processes and Landforms (3 hours, lab) A. Shoreline processes 1. Waves 2. Erosion 3. Sediment transport 4. Deposition B. Geomorphic evolution of coastal areas 1. Submergent coasts 2. Emergent coasts
XVII.	Field Study (3 hours, lab)

	A. Local area to observe coastal landforms and processes
Total Lecture Hours:	0
Total Laboratory Hours:	54
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):	2) Problem solving demonstrations (computational or non-computational)
Typical Assignment Using Primary Method of Evaluation:	Examine each rock in the box and indicate the type of igneous rock, [volcanic (V) or plutonic (P)], and the texture (grain size), using the guide in the lab manual. Sort each category for further differentiation into mafic, intermediate, and felsic rocks. a. Which rocks will weather the fastest? b. Which rocks were formed by lava flows? c. Which rocks are not crystalline?
Critical Thinking Assignment 1:	Using the contour map of Death Valley (Figure 1), identify the following features: alluvial fans, playas, pediment, mountains. Outline each feature with a different color pencil. a. What are the prominent features extending from the mountain front and how did they form? b. What happens to a single stream channel as it leaves the canyon? Form a hypothesis to explain your observation.
Critical Thinking Assignment 2:	In a one-page essay, compare and contrast the two different types of volcanic eruptions described on the following pages (Figure 2). How are the Kilauea eruptions similar to and different from Mt. St. Helens' eruptions? Make a chart comparing the lava types, volcano shapes, speed and types of volcanic hazards, and resulting volcanic rock.
Other Evaluation Methods:	Completion, Fieldwork, Laboratory Reports, Matching Items, Multiple Choice, Other Exams, Quizzes, True/False
Instructional Methods:	Demonstration, Discussion, Field trips, Lecture
If other:	Identifying rock and mineral specimens. Map and photograph analysis; computer-based and Internet exercises, and collection and analysis of other geologic data.
Work Outside of Class:	Course is lab only - minimum required hours satisfied by scheduled lab time
If Other:	
Up-To-Date Representative Texts:	Deline, Harris, Tefend. Laboratory Manual for Introductory Geology. 1st Edition. Published by University of North Georgia, 2016. (Discipline Standard)
Alternative Texts:	

Required Supplementary Readings:	
Other Required Materials:	
Requisite:	Prerequisite
Category:	sequential
Requisite course(s): List both prerequisites and corequisites in this box.	GEOL 1
Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).	Knowledge of how various rocks are formed by igneous, sedimentary, and metamorphic processes. GEOL 1 - Relate the characteristics and nature of the common rock-forming minerals and rocks to the processes that formed them. Understanding of how folding and faulting occur in the earth's crust as related to plate tectonics theory. GEOL 1 - 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. Knowledge of surface geomorphology processes, including how and where they occur. GEOL 1 - Describe the processes of weathering and erosion of rocks, including methods by which streams, groundwater, glaciers, wind, and ocean waves shape the surface. Comprehension of the concepts of geologic time, geologic columns, and geologic maps. GEOL 1 - Compare and contrast the methods used to determine the age of the earth, the geologic time scale, and methods of dating rocks.
Requisite Skill:	
Requisite Skill and Matching Skill(s): Bold the requisite skill(s). If applicable	
Requisite course:	
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Enrollment Limitations and Category:	
Enrollment Limitations Impact:	
Course Created by:	Wallace Ford
Date:	09/01/1950
Original Board Approval Date:	
Last Reviewed and/or Revised by:	Azul Rodriguez
Date:	10/01/2025
Last Board Approval Date:	01/21/2026
Effective Term:	FA 2026