El Camino College

COURSE OUTLINE OF RECORD - Official

I. GENERAL COURSE INFORMATION

Subject and Number: Geology 34
Descriptive Title: Geology Laboratory of Southeastern California

Course Disciplines: Earth Science

Division: Natural Sciences

Catalog Description: This course is a field and laboratory study of the fault history, rock types, and structural and landform features of the deserts of Southeastern California with a focus on volcanic processes and desert landforms in the Mojave Desert and Anza-Borrego regions.

Conditions of Enrollment:

Prerequisite

Geology 1
with a minimum grade of C or concurrent enrollment

Recommended Preparation

English 84

Course Length: [X] Full Term [ ] Other (Specify number of weeks):
Hours Lecture: 0 hours per week [ ] TBA
Hours Laboratory: 3.00 hours per week [X] TBA
Course Units: 1.00

Grading Method: Letter
Credit Status Associate Degree Credit

Transfer CSU: [X] Effective Date: 3/18/2002
Transfer UC: [X] Effective Date: Fall 2002

General Education:

El Camino College: 1 – Natural Sciences
Term: Other:

CSU GE:

B1 - Physical Science
Term: Other:

B3 - Laboratory Sciences
Term: Other:

IGETC: **5A - Physical Science, Lab only**

Term: 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. As a part of the series of geology courses, we want students to understand how their environment in general and the Earth in particular affects their lives, and how their actions and their society's actions can affect the natural systems that sustain us all.SLO Statement:"Students recognize and can accurately articulate how the Earth affects humans' lives and how human activities affect the Earth.(Recognize → valuing: learning outcome related to attitudes, behaviors, and values; articulate (explain) → comprehension: learning outcome related to knowledge)

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. Identify minerals that occur in igneous, metamorphic and sedimentary rocks that commonly occur in the Southeastern California desert region.

   Quizzes

2. Compare and contrast the different types of folds that occur in the mountains of southern California, Mojave Desert, and Anza-Borrego region.

   Other exams

3. Determine the age relations of rocks in the Anza - Borrego region, and the Mojave Desert region using the principles of relative age dating.

   Performance exams

4. Analyze the geologic history of the Southeastern California Desert region.

   Field work

5. Identify the surface features associated with faults.

   Field work

6. Describe how landforms are the surface expression of geologic processes by working with and constructing contour maps.

   Field work

7. Identify surface features and landforms that are common in arid regions such as those found in the Mojave Desert and Anza-Borrego region.

   Field work

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

Lab	3	I	Rock-forming minerals A. Physical properties B. Identification
Lab	3	II	Plutonic and Volcanic Igneous Rocks A. Composition and texture B. Formation C. Identification
Lab	3	III	Features of volcanic rocks in the deserts of southeastern California A. Lava types - aa & pahoehoe B. Cinder cones C. Bombs D. Ash deposits and tuff deposits E. Volcanic Domes
Lab	1.5	IV	Sedimentary Rocks (Mojave Desert and Anza-Borrego region) A. Fluvial deposits B. Alluvial fans
Lab	1.5	V	Metamorphic Rocks (Mojave Desert, Anza-Borrego region, mountains surrounding these areas) A. Composition and texture
Lab	3	VI	Running Water (Mojave River, streams in the Anza-Borrego region) A. Stream properties B. Erosional features in the Mojave Desert C. Erosional features in the Anza-Borrego region
Lab	3	VII	Erosion of Mountains (Mojave Desert and Anza-Borrego region) A. Desert environments B. Fault scarps C. Formation of canyons D. Uplift and formation of the San Bernardino Mountains along the San Andreas fault E. Uplift and formation of mountains surrounding the Imperial Valley and along the San Andreas fault F. Erosion of the mountains surrounding the Mojave Desert and Anza-Borrego region
Lab	36	VIII	Field Trip Most of the instructional lab time will be in the field during a 4-day weekend field excursion. The geologic features of the Mojave Desert and the Sonoran Desert in the Anza Borrego area and the Imperial Valley will be examined at approximately thirty locations. A. Volcanic rock types Mojave Desert and Imperial Valley) 1. Pahoehoe and aa 2. Basalt and rhyolite 3. Cinders, lapilli

			4. Tuff and ash deposits B. Plutonic rock types (San Bernardino mountains, Peninsular Ranges) 1. Granite 2. Gabbro 3. Other rocks of intermediate composition C. Sedimentary rock types (Mojave Desert, Anza Borrego) 1. Sandstone 2. Shale 3. Conglomerate D. Volcanic landforms (Mojave Desert and Imperial Valley adjacent to Anza Borrego) 1. Cinder cones 2. Rhyolite domes 3. Lava tubes and Lava flows E. Sedimentary features (Mojave Desert, Anza-Borrego) 1. Layering 2. Bedding 3. Graded bedding 4. Cross-bedding F. Alluvial fans (north side of the San Bernardino Mountains, Anza-Borrego) G. Ancient pluvial lakes and shorelines (Mojave Desert and Anza-Borrego, Imperial Valley) H. Modern river erosion (Mojave River in Afton Canyon) I. Geologic history of rocks (mountains of southern California, Anza-Borrego, Imperial Valley) J. Faulting (mountains of southern California surrounding the Mojave Desert, Peninsular Ranges, Chocolate Mountains - observing the San Andreas fault)
Total Lecture Hours	0		
Total Laboratory Hours	54		
Total Hours	54		

IV. PRIMARY METHOD OF EVALUATION AND SAMPLE ASSIGNMENTS

A. **PRIMARY METHOD OF EVALUATION:**

Problem solving demonstrations (computational or non-computational)

B. **TYPICAL ASSIGNMENT USING PRIMARY METHOD OF EVALUATION:**

Examine the rock samples from Southeastern California and provide the following information on your lab report.

a. Name the sedimentary rock.

b. Indicate the environment of deposition in which the rock formed.

c. What water energy (speed) was involved?

d. What size grains are visible?

C. **COLLEGE-LEVEL CRITICAL THINKING ASSIGNMENTS:**

1. Construct a detailed cross-section of the structural provinces from the Mojave Desert southward toward the Coachella Valley and the Salton Sea. Interpret the geologic history of the rocks that are present in each of these areas.

2. In a one-page essay, analyze the sedimentary depositional environments of rocks in the Mojave Desert and how their formation is influenced by motion along the San Andreas fault.

D. **OTHER TYPICAL ASSESSMENT AND EVALUATION METHODS:**

Other exams

Laboratory reports

Field work

Multiple Choice

Completion

Matching Items

Other (specify):

Short essay questions

Identify rocks in the laboratory

Journal (kept regularly throughout the course)

V. INSTRUCTIONAL METHODS

Demonstration
Field trips
Laboratory

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

Course is lab only - minimum required hours satisfied by scheduled lab time and estimated student hours outside of class per week is zero.

Estimated Independent Study Hours per Week: 0

VII. TEXTS AND MATERIALS

A. **UP-TO-DATE REPRESENTATIVE TEXTBOOKS**
Herzig. Geology Laboratory of Southeastern California. 1.1 ed. El Camino College, 2017.
Qualifier Text: Laboratory Manual is created to cover course materials.,

B. **ALTERNATIVE TEXTBOOKS**

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
Course Prerequisite Geology-1	Standard Requisite

B. Requisite Skills

Requisite Skills
Understand how different minerals form igneous, sedimentary, and metamorphic rocks learned in Geology 1.
Understand the processes and importance of plate tectonics and extension beneath continental interiors learned in Geology 1.
Knowledge of the processes of how faults create valleys and mountains learned in Geology 1.
Understand the process of erosion in arid environments learned in Geology 1.

C. Recommended Preparations (Course and Non-Course)

Recommended Preparation	Category and Justification
Course Recommended Preparation English-84	

D. Recommended Skills

Recommended Skills
Students are expected to read and understand college level textbooks. Select and employ reading strategies to interpret the content of a college-level textbook, with special focus on constructing a thesis statement and providing valid support.

E. Enrollment Limitations

Enrollment Limitations and Category	Enrollment Limitations Impact

Course created by Charles T. Herzig on 02/01/2002.

BOARD APPROVAL DATE: 03/18/2002

LAST BOARD APPROVAL DATE: 12/18/2017

Last Reviewed and/or Revised by Charles Herzig on 09/17/2017

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