



El Camino College
COURSE OUTLINE OF RECORD – Approved

I. GENERAL COURSE INFORMATION

Subject and Number: Geology 4
Descriptive Title: History of Planet Earth Laboratory
Course Disciplines: Earth Science
Division: Natural Sciences

Catalog Description:

This course utilizes laboratory exercises and field study to apply geologic principles in identification of minerals, igneous, metamorphic, and sedimentary rocks and fossils and their use in interpreting earth history, age relationships, and paleogeography of selected regions.

Conditions of Enrollment:

Prerequisite: Geology 2 with a minimum grade C or concurrent enrollment

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

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:

CSU GE:

B1 - Physical Science

Term:

Other: Approved

B3 - Laboratory Sciences

Term:

Other: Approved

IGETC:

5A - Physical Science, Lab only

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)

- 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 the 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. Interpret the plate tectonic setting for the fossils, rocks and geologic structures of a particular area.
 - **Class Performance**
2. Identify fossils, their age and environment of deposition, and the rocks that contain them to interpret geologic history.
 - **Field work**
3. Use relative and absolute dating methods to determine sequence of events in earth history.
 - **Laboratory reports**
4. Interpret the geologic history shown on Geologic Maps of North America.
 - **Objective Exams**

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	Principle of Uniformitarianism
Lab	3	II	Plate Tectonics
Lab	3	III	Identification of Sedimentary Rocks
Lab	3	IV	Age Relations and Unconformities A. Methods of relative age dating B. Recognition and interpretation of conformities
Lab	3	V	Study of Paleogeographic Reconstruction Sediment Types, Fossil's Stratification Types
Lab	3	VI	Fossils A. Recognition and preservation B. Classification of life and environments C. Study of the phyla important in the fossil record D. Use of fossils as indicators of environments E. Stratigraphic problems

Lab	12	VII	Field Studies A. Local area to observe sedimentary rocks and fossils
Lab	12	VIII	Geologic Maps A. Structure sections B. Identification of structures from maps C. Interpretation of geologic history D. Construction of geologic maps
Lab	6	IX	Regional Studies
Lab	3	X	Igneous and Metamorphic Rocks
Lab	3	XI	Minerals and their Physical Properties
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 trilobite fossils in the tray and identify their various features. Create a chart that shows how the trilobites change through time and how this reflects the environment in which they lived.

C. COLLEGE-LEVEL CRITICAL THINKING ASSIGNMENTS:

1. Construct a complete geologic history for the rocks at the Grand Canyon, using the geologic time scale in your history of events.
2. Identify the fossils in the sample trays using their morphologic characteristics. Determine which morphological characteristics are most useful for field identification of these fossils when they are found within rocks. Record your observation on your laboratory data report sheet.

D. OTHER TYPICAL ASSESSMENT AND EVALUATION METHODS:

Other exams

Laboratory reports

Field work

Class Performance

Completion

Other (specify):

Identify fossils and rocks in laboratory, also demonstrate skills in map interpretation

Short identification questions, identify fossils and rocks, and map problems

V. INSTRUCTIONAL METHODS

- Demonstration
- Discussion
- Field trips
- Group Activities
- Internet Presentation/Resources
- 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

- Study
- Required reading
- Observation of or participation in an activity related to course content
- 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

B. ALTERNATIVE TEXTBOOKS

Herzig. Geology 4: History of Planet Earth Laboratory Manual. El Camino College, 2017.

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-2	Sequential

B. Requisite Skills

Requisite Skills
Knowledge of how sedimentary rocks and fossils are formed. GEOL 2 - Define Uniformitarianism. GEOL 2 - Develop ideas for the origin of life and its early development on Earth. GEOL 2 - Test competing theories for evolution and their evidence in the fossil record. GEOL 2 - Describe the Precambrian history of life on Earth and how it removed carbon dioxide from the atmosphere and added oxygen. GEOL 2 - Explore the statement that the "Burgess fauna" are the most important fossils on Earth. GEOL 2 - Explain Gould's idea of contingency and its application to the fossils record.

<p>GEOL 2 - Formulate hypotheses to explain the rise of animals 570 million years ago and their subsequent evolution.</p> <p>GEOL 2 - Formulate hypotheses to explain the Permian and Cretaceous-Paleogene extinction events.</p> <p>GEOL 2 - Develop ideas to test competing hypotheses about whether dinosaurs were warm-blooded or cold-blooded and how this affected their lifestyles.</p> <p>GEOL 2 - Explain the relationship between the evolution of social insects and flowers.</p> <p>GEOL 2 - Understand the origin and evolution of mammals.</p> <p>GEOL 2 - Evaluate different models for the evolution of primates.</p>
<p>Understanding of geologic time and age relationships in rocks.</p> <p>GEOL 2 - Explain the difference between relative and absolute time. Understand how isotopic dating measures the age of a rock.</p> <p>GEOL 2 - Define Uniformitarianism.</p>
<p>Knowledge of fossils and their use as dating tools.</p> <p>GEOL 2 - Explain the difference between relative and absolute time. Understand how isotopic dating measures the age of a rock.</p> <p>GEOL 2 - Define Uniformitarianism.</p> <p>GEOL 2 - Develop ideas for the origin of life and its early development on Earth.</p> <p>GEOL 2 - Explain the relationship between life and chemical processes.</p> <p>GEOL 2 - Test competing theories for evolution and their evidence in the fossil record.</p>
<p>Understanding of ancient environments as evidenced by sedimentary rocks and fossils.</p> <p>GEOL 2 - Develop ideas for the origin of life and its early development on Earth.</p> <p>GEOL 2 - Explain the relationship between life and chemical processes.</p> <p>GEOL 2 - Test competing theories for evolution and their evidence in the fossil record.</p> <p>GEOL 2 - Describe the Precambrian history of life on Earth and how it removed carbon dioxide from the atmosphere and added oxygen.</p> <p>GEOL 2 - Formulate hypotheses to explain the rise of animals 570 million years ago and their subsequent evolution.</p> <p>GEOL 2 - Formulate hypotheses to explain the Permian and Cretaceous-Paleogene extinction events.</p> <p>GEOL 2 - Develop ideas to test competing hypotheses about whether dinosaurs were warm-blooded or cold-blooded and how this affected their lifestyles.</p> <p>GEOL 2 - Explain the relationship between the evolution of social insects and flowers.</p> <p>GEOL 2 - Understand the origin and evolution of mammals.</p> <p>GEOL 2 - Understand the geologic development of North America from the Precambrian to the present.</p> <p>GEOL 2 - Explain the tectonic history of western North America.</p> <p>GEOL 2 - Evaluate models for the origin of the San Andreas fault.</p> <p>GEOL 2 - Develop and test hypotheses to explain the Ice Age.</p> <p>GEOL 2 - Explain global warming and test hypotheses for its origin.</p>

C. Recommended Preparations (Course and Non-Course)

Recommended Preparation	Category and Justification
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D. Recommended Skills

Recommended Skills

E. Enrollment Limitations

Enrollment Limitations and Category	Enrollment Limitations Impact
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Course created by Ford and Pipkin on 02/01/1957.

BOARD APPROVAL DATE:

LAST BOARD APPROVAL DATE: 12/17/2018

Last Reviewed and/or Revised by: Charles Herzig
17528

Date: 10/06/2018