

GEOL - 2 - History of Planet Earth

Revised Curriculum Office Use Only

19-20 Revised Curriculum Use Only

COURSE OUTLINE OF RECORD

VIII. General Course Information

Subject:*

GEOL

Course Number:* 2

Descriptive Title:* History of Planet Earth

Course Disciplines:*

Earth Science

Division:

Natural Sciences

Department:*

Earth Science

Catalog Description:*

This course is a study of the history of the Earth since the time of its formation to the present day. It integrates plate tectonics into a detailed investigation of the dynamics of the Earth's geologic forces and their effect on the atmospheric, oceanic, and biologic realms. The effect of extraterrestrial events such as asteroid impacts that have shaped our habitable world are also covered.

Conditions of Enrollment:

Prerequisite:

Co-requisite:

Recommended Preparation:

Geology 1 AND English 1 or eligibility for English 1A or qualification by appropriate assessment

Enrollment
Limitation:

Course Length: Full Term

Hours Lecture (per
week): 3

Hours Laboratory (per
week): 0

Outside Study Hours:* 6

Total Hours:* 54

Course Units:* 3

Grading Method:

Letter Grade only

Credit Status:

Credit, degree applicable

Transfer CSU: Yes
 No

Effective Date: Prior to July 1992

Transfer UC: Yes
 No

Effective Date: Prior to July 1992

General Education
ECC:

Area 1 - Natural Sciences

Term:

Other: Approved

CSU GE:

Area B1 - Physical Universe and its Life Forms: Physical Science

Term:

Other: Approved

IGETC:

Area 5A - Physical Science

Term: Fall 1991

Other:

IX. Outcomes and Objectives

A. Student Learning Outcomes SLOs (The course student learning outcomes are listed below.)

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.

B. Course Objectives (The major learning objectives for this course are listed below.)

Course Objectives:

1. Use the Scientific Method to formulate and test hypotheses.
2. Describe the Solar Nebula Theory for the origin of the Solar System and Earth.
3. Explain the difference between the inner rocky and outer gaseous planets.
4. Describe the accretionary model for the origin of the Earth and the importance of global differentiation for the formation of a layered Earth. Discuss and name common rocks, minerals, and elements.
5. Describe the Theory of Plate Tectonics, how it was developed, and how it explains earthquakes, volcanoes, and other geologic phenomena.
6. Apply the Theory of Plate Tectonics to the paleogeography of planet Earth.
7. Explain the difference between relative and absolute time. Understand how isotopic dating measures the age of a rock.
8. Define Uniformitarianism.
9. Develop ideas for the origin of life and its early development on Earth.
10. Explain the relationship between life and chemical processes.
11. Test competing theories for evolution and their evidence in the fossil record.
12. Describe the Precambrian history of life on Earth and how it removed carbon dioxide from the atmosphere and added oxygen.
13. Explore the statement that the "Burgess fauna" are the most important fossils on Earth.
14. Explain Gould's idea of contingency and its application to the fossil record.
15. Formulate hypotheses to explain the rise of animals 540 million years ago and their subsequent evolution.
16. Test hypotheses to explain why and how life moved on land during the Paleozoic era.
17. Formulate hypotheses to explain the Permian and Cretaceous-Paleogene extinction events.
18. Develop ideas to test competing hypotheses about whether dinosaurs were warm-blooded or cold-blooded and how this affected their lifestyles.
19. Explain the relationship between the evolution of social insects and flowers.
20. Understand the origin and evolution of mammals.
21. Evaluate different models for the evolution of primates.
22. Understand the geologic development of North America from the Precambrian to the present.
23. Explain the tectonic history of western North America.
24. Evaluate models for the origin of the San Andreas fault. Test ideas how the San Andreas fault is related to the changes in plate tectonic configuration of the west coast of North America during the Cenozoic.
25. Develop and test hypotheses to explain the Ice Age.
26. Explain global warming and test hypotheses for its origin.

X. Outline of Subject Matter

(Topics should be detailed enough to enable an instructor to determine the major areas that should be covered to ensure consistency from instructor to instructor and semester to semester.)

Example:

- I. Main Topic (3 hours, lecture)
 - A. Sub topics
 - B. Sub topics
 - 1. Super sub topic
 - 2. Super sub topic

Major Topics:

I. Introduction (3 hours, lecture)

1. Study of planet earth
2. The scientific method

II. Origin of solar system and Earth (3 hours, lecture)

III. Earth materials (3 hours, lecture)

1. Elements
2. Rocks
3. Minerals

IV. Plate tectonics (6 hours, lecture)

1. Crustal Interactions
2. Subduction Zones

V. Geologic Time and Its Measurement (3 hours, lecture)

1. Geologic time scale
2. Relative and absolute age dating (Isotopic Systematics)
3. Stratigraphy and Interpreting Strata

VI. Fossils and Fossilization (3 hours, lecture)

1. Body fossils
2. Trace fossils
3. Methods of preservation in rock record

VII. Evolution (3 hours, lecture)

1. Competing theories
2. Gradualism
3. Punctuated equilibrium

VIII. Precambrian History of Earth (6 hours, lecture)

1. 4.6 billion years to 540 million years
2. Burgess fauna
3. Origin of sex

IX. Paleozoic History (3 hours, lecture)

1. Pangaea
2. Invertebrates and Vertebrate evolution
3. Permian extinction and its potential causes
4. Geologic evolution of western North America

X. Mesozoic History (9 hours, lecture)

1. Break-up Pangaea

- 1. Break up Pangaea
- 2. Dinosaurs and the evolution of birds
- 3. Flowers and insects (co-evolution)
- 4. Evolution of Mammals
- 5. Geologic evolution of western North America

XI. Extinction and impacts (3 hours, lecture)

- 1. Permian mass extinction comparison
- 2. Cretaceous-Paleogene mass extinction

XII. Cenozoic History (6 hours, lecture)

- 1. Rise of birds and mammals
- 2. Primates
- 3. Humans
- 4. Geologic evolution of western North America
- 5. Evolution of the San Andreas fault
- 6. Geologic Development of southern California

XIII. Recent Climate Change (3 hours, lecture)

- 1. Glacial cycles
- 2. Milankovitch theory
- 3. Global warming and CO2

Total Lecture Hours: 54

Total Laboratory Hours: 0

Total Hours: 54

XI. Primary Method of Evaluation and Sample Assignments

A. Primary Method of Evaluation (choose one):

Primary Method of Evaluation

1) Substantial writing assignments

B. Typical Assignment Using Primary Method of Evaluation

Typical Assignment Using Primary Method of Evaluation:

Examine a map of the Earth showing the present-day position of the continents and oceans. Identify evidence on the map that the continents and oceans had different geographic locations in the past. In a 3-5 page paper, explain how does this evidence support the theory of plate tectonics?

C. College-level Critical Thinking Assignments

Critical Thinking Assignment 1: Examine planetary data for the atmosphere of Earth and Mars both at their time of formation and the present day. In a one-page essay, compare the data to formulate testable hypotheses to explain why the present-day atmospheres of Earth and Mars are different.

Critical Thinking Assignment 2: Examine paleontological data showing the types and distribution of life forms during the late Cretaceous (70 million years ago) and the early Paleogene (60 million years ago). In a one-page essay, use the data to formulate testable hypotheses to explain why there was a major change in the fauna and flora across this time interval.

D. Other Typical Assessment and Evaluation Methods

Other Evaluation Methods: Completion Essay Exams Homework Problems Matching Items
 Multiple Choice Other Exams Quizzes Term or Other Papers True/False
 Written Homework

If Other: Identifying paleogeographic features on maps.

XII. Instructional Methods

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.

Instructional Methods: Demonstration Discussion Group Activities Lecture
 Multimedia presentations

If other:

XIII. Work Outside of Class

Work Outside of Class Problem solving activity Required reading Study
 Written work (such as essay/composition/report/analysis/research)

If Other:

XIV. Texts and Materials

A. Up-to-date Representative Textbooks: (Please use the following format: Author, Title, Edition, Publisher, Year. If you wish to list a text that is more than 5 years old, please annotate it as a “discipline standard”.)

Up-To-Date Representative Textbooks: Herzig. History of Planet Earth Workbook and Lecture Notes. 4.2 ed. El Camino College, 2018.

Prothero. Evolution of the Earth. 8th ed. McGraw Hill, 2012.

B. Alternative Textbooks: (Please use the following format: Author, Title, Edition, Publisher, Year. If you wish to list a text that is more than 5 years old, please annotate it as a “discipline standard”.)

Alternative Textbooks:

C. Required Supplementary Readings

Required Supplementary Readings:

D. Other Required Materials

Other Required Materials:

XV. Conditions of Enrollment

A. Requisites (Course Prerequisites and Corequisites) Skills needed without which a student would be highly unlikely to succeed.

Requisite

Category

Requisite course:

Requisite and Matching skill(s):
Bold the requisite skill. List the corresponding course objective under each skill(s).

B. Requisite: (Non-Course Prerequisite and Corequisites) Skills needed without which a student would be highly unlikely to succeed.

Requisite:

Requisite and Matching skill(s):
Bold the requisite skill. List the corresponding course objective under each skill(s). if applicable

C. Recommended Preparations (Course) (Skills with which a student's ability to succeed will be strongly enhanced.)

Requisite course: Geology-1 AND English 1

Requisite and Matching skill(s):
Bold the requisite skill. List the corresponding course objective under each skill(s).

Students need well-developed reading skills in order to understand and interpret information in their textbooks and writing skills to develop essays and projects. Students need to read a very technical textbook as well as write a research-based report.

ENGL 1- Summarize, analyze, evaluate, and synthesize college-level texts.
 ENGL 1 -Write a well-reasoned, well-supported expository essay that demonstrates application of the academic writing process.

A recommended skill is a mastery of the vocabulary of the Earth and Earth processes acquired by having already taken an Earth Science - Geology class, or concurrent enrollment.

GEOL 1 -Relate the characteristics and nature of the common rock-forming minerals and rocks to the processes that formed them.
 GEOL 1 - Describe the processes, hazards, and results of igneous activity.
 GEOL 1 - Compare and contrast the methods used to determine the age of the earth, the geologic time scale, and methods of dating rocks.

D. Recommended Preparation (Non-Course) (Skills with which a student's ability to succeed will be strongly enhanced.)

Requisite: Eligibility for English 1A or qualification by appropriate assessment

Requisite 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.

Summarize, analyze, evaluate, and synthesize college-level texts.
 Write a well-reasoned, well-supported expository essay that demonstrates application of the academic writing process.

E. Enrollment Limitations

Enrollment Limitations and Category:

**Enrollment
Limitations Impact:**

STEP 2: Click  Save All Changes.

STEP 3: Launch proposal by clicking  in the top left corner of this page.

STEP 4: Click on the  at the top of the Proposal Toolbox to submit proposal for review.

STEP 5: When the "Your Decision" box appears, click Approve and "Make My Decision" to move the proposal forward in the process.

Course Created by: W. E. Ford/ Mr. Pipkin

Date: 05/01/1988

Board Approval Date:

Last Board Approval Date: 11/16/2020 Effective FALL 2021

Last Reviewed and/or Revised by: Charles Herzig

Date: 05/05/2020

Are these revisions minor or major? minor major

Acalog Course Type:

TOP Code:

CIP Code:

SAM Code:

SOC Code:

Transfer Status:

Basic Skills:

UC Approval Date:

CSU Approval Date:

IGETC Approval Date:

**CSU GE Approval
Date:**