GEOL 1 Course Outline as of Fall 2012

CATALOG INFORMATION

Dept and Nbr: GEOL 1 Title: THE EARTH Full Title: The Earth Last Reviewed: 1/27/2020

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	6	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00

Total Student Learning Hours: 157.50

Title 5 Category:	AA Degree Applicable
Grading:	Grade or P/NP
Repeatability:	00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:	
Formerly:	

Catalog Description:

An introduction to rocks, minerals, landforms and the dynamic processes that shape the Earth. Course includes the study of plate tectonics, volcanoes, earthquakes, and surface processes such as streams, shorelines and glaciers.

Prerequisites/Corequisites:

Recommended Preparation: Eligibility for ENGL 1A or equivalent

Limits on Enrollment:

Schedule of Classes Information:

Description: An introduction to rocks, minerals, landforms and the dynamic processes that shape the Earth. Course includes the study of plate tectonics, volcanoes, earthquakes, and surface processes such as streams, shorelines and glaciers. (Grade or P/NP) Prerequisites/Corequisites: Recommended: Eligibility for ENGL 1A or equivalent Limits on Enrollment:

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	Area C	Natural Science	S	Effective: Fall 1984	Inactive:
CSU GE:	Transfer Area B1	Physical Scienc	e	Effective: Fall 1984	Inactive:
IGETC:	Transfer Area 5A	Physical Scienc	es	Effective: Fall 1981	Inactive:
CSU Transfer:	Transferable	Effective:	Fall 1984	Inactive:	
UC Transfer:	Transferable	Effective:	Fall 1984	Inactive:	
CID·					

CID Descriptor:GEOL 100	Physical Geology
SRJC Equivalent Course(s):	GEOL1

Certificate/Major Applicable:

Major Applicable Course

COURSE CONTENT

Outcomes and Objectives:

1. Define the nature of geology as a science.

2. Utilize Plate Tectonic Theory to summarize the relationships among the rock cycle, tectonic setting, geologic structures, volcanism and earthquake activity, and provide examples illustrating these relationships.

3. Differentiate various layers of Earth's interior.

- 4. Distinguish between rocks and minerals, and classify common minerals.
- 5. Describe the lithology and formation of igneous, sedimentary, and metamorphic rocks.

6. Use classification charts to identify major rock types and sub-types.

7. Quantify geologic time and use relative and radiometric dating methods to interpret Earth's history. Describe the use of fossils in constructing the geologic time scale.

8. Classify and illustrate volcanic landforms, and locate significant volcanic features on Earth.

9. Explain the causes, effects, and measurement scales of earthquakes.

10. Describe surface processes and identify the landforms associated with each process.

11. Evaluate the effects of geologic hazards on humans, and the human impact on these phenomena.

Topics and Scope:

- I) Introduction to Science and Geology
 - A) The history of geology
 - B) The scientific method
 - C) Major spheres of Earth
 - D) Earth's internal structure

II) Plate Tectonic Theory

A) Development of the theory

- 1) Continental Drift
- 2) Seafloor Spreading
- 3) Paleomagnetism
- 4) Supporting evidence
- 5) Mantle convection
- B) Plate boundaries: formation and evolution of associated structures
- III) Earth Materials
 - A) Matter and Minerals
 - 1) Elements and the Periodic Table
 - 2) Atoms and atomic structure
 - 3) Bonding
 - 4) Silicates and common mineral structures
 - 5) Common non-silicates
 - 6) Physical properties of minerals
 - B) Igneous rocks
 - 1) Definition
 - 2) Common textures and compositions
 - 3) Magmatic formation
 - 4) Magmatic differentiation and Bowen's Reaction Series
 - 5) Tectonics and igneous processes
 - C) Sedimentary rocks
 - 1) Formation of sediment: weathering and erosion
 - 2) Definition
 - 3) Common textures and compositions
 - 4) Sedimentary (depositional) environments
 - 5) Sedimentary structures
 - 6) Tectonics and sedimentary processes
 - D) Metamorphic rocks
 - 1) Definition
 - 2) Causes of metamorphism
 - 3) Common textures and compositions
 - 4) Metamorphic environments
 - 5) Tectonics and metamorphic processes
- IV) Geologic Time
 - A) Relative dating
 - B) Radiometric dating
 - C) The fossil record
 - D) The geologic time scale
- V) Volcanic Processes
 - A) Properties and composition of magma/lava
 - B) Eruptive styles
 - C) Volcanic landforms
 - D) Volcanic hazards
- VI) Structural Geology
 - A) Deformation
- B) Geologic structures
- VII) Earthquakes and Seismology
 - A) Seismic waves
 - B) Earthquake measurement scales
 - C) Epicentral location and triangulation
 - D) Seismic hazards
- VIII) Surface Processes (at least 3 of the following topics):

- A) Mass wasting
 - 1) Causes/ triggers
 - 2) Classification
 - 3) Mitigation of landslide hazards
- B) Stream processes
 - 1) The hydrologic cycle
 - 2) Stream channels and flow
 - 3) Erosional and depositional landforms
 - 4) Flooding and surface water management
- C) Groundwater
 - 1) The hydrologic cycle
 - 2) Storage and flow
 - 3) Extraction and human impact on groundwater
- D) Glacial processes
 - 1) Types of glaciers
 - 2) Formation and movement
 - 3) Erosional and depositional landforms
- E) Desert processes
 - 1) Characteristics
 - 2) Formation and location of deserts
 - 3) Erosional and depositional landforms
 - a) Water
 - b) Wind
- F) Coastal processes
 - 1) Wave formation and characteristics
 - 2) Erosional and depositional landforms
 - 3) Emergent and submergent coastlines
 - 4) Longshore processes
 - 5) Mitigation of coastal change

Assignment:

1. Assigned readings (20-30 pages per week)

2. Assignments (5-15): research papers, essays, written homework, problem solving exercises, online activities

- 3. Exams (3-5); quizzes (5-15)
- 4. Class participation: in-class activities, discussions, group work, attendance

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Written homework, research papers, essays, in-class activites, online activities

Writing 10 - 40% **Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Problem solving exercises, in-class activities, group work, discussions

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None

Exams: All forms of formal testing, other than skill performance exams.

Exams: essay, multiple choice, true/false, matching items, completion, short answer; quizzes

Other: Includes any assessment tools that do not logically fit into the above categories.

Class participation and attendance

Representative Textbooks and Materials:

Earth: An Introduction to Physical Geology, Tarbuck, Lutgens and Tasa, 10th ed, Pearson/Prentice Hall (2011)

The Essential Earth, Jordan and Grotzinger, 1st ed, Freeman Bedford and Worth Publishers (2009)

Essentials of Geology, Marshak, 2nd ed, Norton and Co. (2009)

Physical Geology, Plummer, Carlson and Hammersley, 13th ed, McGraw Hill (2010) Understanding Earth, Grotzinger and Jordan, 6th ed, Freeman Bedford and Worth Publishers (2010)

GEOL, Wicander and Monroe, 1st ed, Brooks/Cole Publishers (2010)

Problem solving 10 - 40%

Skill Demonstrations 0 - 0%



