GEOL A110: PHYSICAL GEOLOGY

Item	Value
Curriculum Committee Approval Date	12/09/2020
Top Code	191400 - Geology
Units	4 Total Units
Hours	108 Total Hours (Lecture Hours 54; Lab Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Open Entry/Open Exit	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)
Associate Arts Local General Education (GE)	• Area 5 Physical and Biological Sciences, Scientific Inquiry, Life Science (OB)
Associate Science Local General Education (GE)	• Area 5 Physical and Biological Sciences, Scientific Inquiry, Life (OSB)
California General Education Transfer Curriculum (Cal-GETC)	• Cal-GETC 5A Physical Science (5A) • Cal-GETC 5C Laboratory Activity (5C)
Intersegmental General Education Transfer Curriculum (IGETC)	• IGETC 5A Physical Science (5A) • IGETC 5C Laboratory Activity (5C)
California State University General Education Breadth (CSU GE-Breadth)	• CSU B1 Physical Science (B1) • CSU B3 Laboratory Activity (B3)

Course Description

A study of materials and processes in the earth. A beginning course in physical geology for science and engineering majors and students desiring a science emphasis. One extended field trip required during the semester. Transfer Credit: CSU; UC. C-ID: GEOL 101.**C-ID:** GEOL 101.

Course Level Student Learning Outcome(s)

1. Students will be able to evaluate the reasons for damage from a recent large earthquake.
2. Describe the Earth's interior and geophysical properties, including the theory of plate tectonics.
3. Demonstrate an understanding of relative dating and radiometric dating as they relate to Earth's history and the geologic time scale.
4. Describe the three rock types and the geologic processes involved in each.
5. Demonstrate knowledge of the following geologic resources:fossil fuels, metallic ores, and nonmetallic resources.
6. Distinguish between what is fact, hypothesis, theory and law in geology.
7. Students will be able to assess how plate tectonics accounts for major geologic activity such as mountain building, volcanoes, earthquakes. and trenches.

Course Objectives

- I Lecture Content Objectives
- I. 1. Demonstrate an understanding of the scientific method as it applies to geology.
- I. 2. Demonstrate an understanding of the concepts, principles and interactions of Earth's systems applicable to the geological sciences.
- I. 3. Classify the common materials of the earth?s crust.
- I. 4. Demonstrate an understanding of the rock cycle and identify and describe the basic properties of rocks and minerals.
- I. 5. Evaluate the processes which change the face of the earth?s surface (geomorphology).
- I. 6. Evaluate human effect on geological processes and resources.
- I. 7. Evaluate the geologic processes that have affected the human race.
- I. 8. Demonstrate an ability to communicate complex course concepts effectively in writing and diagrams and apply critical thinking and problem solving skills to make informed decisions in life.
- II Lab Content Objectives
- II. 1. Identify the common minerals and rocks.
- II. 2. Recognize and understand basic geologic structures and processes.
- II. 3. Interpret topographic and geologic maps.
- II. 4. Describe each of the types of seismic waves generated during an earthquake and recognize them on a seismogram.
- II. 5. Calculate earthquake magnitude and intensities.

Lecture Content

The Physical Geology course must address all of the major categories listed below and at least 75% of the subtopics. Introduction to Geology The Scientific Method History of Geology Earth Materials Minerals Igneous, Sedimentary and Metamorphic Rocks Soils Geologic Time and Earth History Geologic Time Relative and Absolute Dating Fossils and Fossilization Earth s Internal Forces Plate Tectonics Earthquakes Volcanism and Igneous Rocks Mountain Building Geological Structures Metamorphism and Metamorphic Rocks Earth s External Processes Weathering Mass Wasting and Erosion Sediment and Sedimentary Rocks Surface Water Processes Groundwater Processes Oceans and Coastal Processes Desert Processes Glacial Processes Earth Resources Renewable and Non-Renewable Resources Metallogenic Provinces

Lab Content

Laboratory activities: (must include at least 10 of the following activity topics) Topographic maps Mineral identification Relative and absolute dating Geologic time Plate tectonics Earthquakes Volcanoes Rock identification Geological structures Geological maps and cross sections Surface water processes Ground water processes Coastal processes Desert processes Glacial processes

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- DE Online Lecture (02X)
- Lab (04)
- DE Live Online Lab (04S)
- DE Online Lab (04X)

Instructional Techniques

1. Lecture and application of ideas 2. Individual, paired and small group exercises 3. Field trips to various areas of local geologic interest

Reading Assignments

Students will spend a minimum of 2 hours per week reading from assigned from textbook(s) and other resources

Writing Assignments

Examinations will include questions requiring written answers

Out-of-class Assignments

Students will spend a minimum of 2 hours per week on homework and field trip(s) assignments, as well as test preparation

Demonstration of Critical Thinking

Examinations will be utilized with both objective and subjective questioning/written format for two mid-term and final examinations. Laboratory work will be examined in these exams as well.

Required Writing, Problem Solving, Skills Demonstration

Examinations will include questions requiring written answers

Textbooks Resources

1. Required Lutgens, Frederick K., Tarbuck, Edward J. and Tasa, Dennis G. Essentials of Geology, 11th ed. N.J.: Prentice Hall, 2011 2. Required AGI, NAGT, Busch, R. M. Tasa, D. G.. Laboratory Manual in Physical Geology, 10th ed. Prentice Hall, 2014 3. Required Grotzinger, John; Jordan, Thomas. Understanding Earth, 6th ed. W.H.Freeman, 2010 Rationale: Most up to date and comprehensive Physical Geology text available today

Other Resources

1. Earth Science, Tarbuck and Lutegens. 2. Laboratory Manual in Physical Geology (9th Edition) by AGI, Feb 2011