Las Positas College
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Course Outline for GEOL 20

EARTH SCIENCE FOR EDUCATORS

Effective: Fall 2020

I. CATALOG DESCRIPTION:
GEOL 20 — EARTH SCIENCE FOR EDUCATORS — 4.00 units

An introduction to the essentials of Earth Science with a laboratory. Topics include the geosphere, atmosphere, hydrosphere, and solar system. This course focuses on the interactions between physical and chemical systems of the Earth such as the tectonic cycle, rock cycle, hydrologic cycle, weather and climate.

3.00 Units Lecture 1.00 Units Lab

Grading Methods:
Letter or P/NP

Discipline:
- Earth Science

	MIN
Lecture Hours:	54.00
Expected Outside of Class Hours:	108.00
Lab Hours:	54.00
Total Hours:	216.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

IV. MEASURABLE OBJECTIVES:

Upon completion of this course, the student should be able to:

A. Explain and apply the principles of the scientific method
B. Apply concepts, principles and interactions of Earth's systems including Hydrologic Cycle, Rock Cycle Plate Tectonics Cycle, Solar System Geologic Time, Weather, and Climate
C. Explain basic properties of minerals and rocks and to identify representative physical samples
D. Explain the processes that shape the Earth and how they change over geologic time
E. Communicate complex course concepts effectively in writing and diagrams

V. CONTENT:
A. Studying Earth Science
    1. What is Earth Science
    2. Introduction to the Scientific Method
B. Earth's Internal Forces
    1. Plate Tectonics
    2. Geologic Structures
    3. Mountain Building
    4. Earthquakes
    5. Volcanoes
C. Earth's Materials
    1. Minerals
    2. Igneous, Sedimentary and Metamorphic Rocks
    3. Soils
D. Earth History
    1. Geologic Time
    2. Relative and Absolute Dating
    3. Fossils and Fossilization
E. Earth's External Processes
    1. Surface Water and Groundwater
    2. Glaciers
    3. Deserts
F. Oceanography
    1. Ocean Currents
    2. Tides

3. Shorelines
G. Atmosphere
    1. Composition of the Atmosphere
    2. Seasons
    3. Weather Patterns and Severe Weather
    4. Climate
H. Astronomy
    1. The Solar System
    2. Stars and Stellar Evolution
    3. Formation of the Universe

VI. LAB CONTENT:
A. The Scientific Method
B. Plate Tectonics, Earthquakes and Volcanoes
C. Faults and Folds
D. Mineral Properties and Identification
E. Rock Properties and Identification
F. Groundwater and Subsidence
G. Surface Processes
H. Astronomy
I. Relative and Absolute Dating and Geologic Time
J. Oceans
K. Fossil Properties and Identification
L. Weather Systems and Atmospheric Moisture

VII. METHODS OF INSTRUCTION:
A. **Lab** -
B. **Lecture** -
C. **Classroom Activity** -

VIII. TYPICAL ASSIGNMENTS:
A. Read Chapters 1 thru 3. Look up the vocabulary words in these chapters and complete online Vocabulary Quiz
    1. Use the textbook glossary and index as needed
B. Memorize the Eons, Eras and Periods of the Geologic Time Scale
C. Complete the Study Guide questions for Exam 4
D. On a world map locate the world's major trenches and the Mid-Oceanic Ridge in all of the major oceans
E. Read Chapter 13 in the textbook
    1. Look up all vocabulary for this chapter
    2. Learn to identify and differentiate the three basic rock types
F. Research Paper
    1. Submit a 5-10 page 12-point paper on a geologic topic approved by the instructor
G. Presentation
    1. Create and present a 5-10 minute presentation on a geologic topic approved by the instructor

IX. EVALUATION:
Methods/Frequency

A. Exams/Tests
    One final exam with periodic midterms or weekly quizzes, and at least one lab practical
B. Quizzes
    Weekly at the instructors discretion
C. Research Projects
    At the instructors discretion
D. Papers
    At the instructors discretion
E. Oral Presentation
    At the instructors discretion
F. Projects
    At the instructors discretion
G. Field Trips
    At the instructors discretion
H. Group Projects
    At the instructors discretion
I. Class Participation
    Daily
J. Class Work
    At the instructors discretion
K. Home Work
    Weekly at the instructors discretion
L. Lab Activities
    Weekly

X. TYPICAL TEXTS:
1. Tarbuck, Edward, Frederick Lutgens, and Dennis Tasa. *Earth Science*. 15th ed., Pearson Education, 2018.
2. Lutgens, Frederick, Edward Tarbuck, and Dennis Tasa. *Foundations of Earth Science*. 8th ed., Pearson Education, 2017.
3. Lutgens, F., Tarbuck, E., and Tasa, D.. • Applications and Investigations in Earth Science, 9th Edition. Pearson Publishers , 2019.
4. Owen, C., Pirie, D., Draper, G.. Earth Lab: Exploring the Earth Sciences, 3rd Edition. Brooks Cole Publishing , 2011.

XI. OTHER MATERIALS REQUIRED OF STUDENTS: