GEOL G106: EARTH SCIENCE FOR TEACHERS

Item	Value
Curriculum Committee Approval Date	10/04/2022
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
Grading Policy	Standard Letter (S)
Local General Education (GE)	• GWC Physical Universe*** (GB1)
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

This course is an introduction to Earth Science for educators. Topics include physical geology, historical geology, physical oceanography, and meteorology, planetary science and astronomy. The scientific method will be employed in relation to Earth Science. The subjects covered are part of the state of California science standards for K-12 classes. Emphasis will be placed on how these topics should be addressed by teachers within the California Science Framework. A field trip may be required. Transfer Credit: CSU; UC. C-ID: GEOL 121. **C-ID:** GEOL 121.

Course Level Student Learning Outcome(s)

1. Course Outcomes
2. Use the scientific method to explain how the Earth's internal processes occur including Plate Tectonics, landforms and volcanic-plutonic activity.
3. Employ the geologic time scale to relate how the Earth has evolved with respect to life forms, atmospheric conditions, oceans and continents.
4. Describe the occurrence and identification of common minerals, rocks, geochemical and environmental conditions of formation.
5. Identify geologic hazards impacting ecosystems due to natural and human impacts.

Course Objectives

- 1. Contrast how the Earths internal and surficial processes occur.
- 2. Analyze how plate tectonics occurs and the results of plate tectonics.
- 3. Demonstrate how life on earth has evolved over time.
- 4. Evaluate how mineral resources have formed and how their extraction and distribution affect humanity.
- 5. Analyze how the Earths oceans have originated, evolved, and are studied.
- 6. Analyze how the Earths atmosphere originated, evolved, and is studied.
- 7. Contrast the physical properties of common minerals and rocks.
- 8. Evaluate the origin and nature of geologic hazards: earthquakes, volcanoes, etc.
- 9. Explain the manner in which life on Earth occurred and its history.
- 10. Evaluate the manner in which plate tectonics has been responsible for the structure of the Earths crust and mountain building.
- 11. Contrast the fundamental processes of physical oceanography and the chemical history.
- 12. Explain the role of plate tectonics with regard to sea floor features.
- 13. Distinguish between the interactions of the atmosphere, hydrosphere, tectonics, and life on Earth.
- 14. Contrast the fundamentals of meteorology and climatology, and the history of climate.
- 15. Evaluate the fundamental concepts of astronomy and planetary geology.
- 16. Employ the use of the Scientific Method in identifying the Earths internal and external processes

Lecture Content

Introduction The scientific method Reasons for studying Earth Science History of geology, oceanography, and meteorology Plate Tectonics - the unifying theory Earth materials Minerals Rocks Economically important materials Surface Processes The hydrosphere Weathering, erosion, and the atmosphere Interaction of geology, meteorology, and oceanography Internal processes Plate Tectonics Earthquakes and Earths interior Structural geology and mountain building Geologic history Geologic time and dating The fossil record and evolution History of Earth and Earths climate Oceanography Plate Tectonics and the sea floor Physical oceanography History of Earths oceans Physical products of oceans Meteorology and Climate Pressure, wind, and weather Weather patterns and storms Climates; their cause and change through time Planetary science and astronomy Relate other planets with Earth Contrast Plate Tectonics, red soils and geological faults

Lab Content

Introduction Employ the scientific method Earth Materials Minerals Rocks Economically important resources Coal Natural gas Oil Surface processes Volcanic Plate Tectonics Weathering and erosion The hydrosphere Internal processes Convection of magma Plate boundaries Earthquakes Geologic Time Scale Evolution of life Paleontology Mass extinction events The Cambrian explosion of life Radiometric Dating, radioactive decay Oceans Ocean basins Coast lines Beach erosion Tides and the Moon Hydrology and weather Ocean currents Climate Climate

change Ice ages Tropical climates Paleoclimates Ice cores Planetary Science Solar System Rock planets Mars Moon formation

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)

Reading Assignments

Textbook. The introduction to each laboratory exercise. Handouts.

Writing Assignments

Write brief answers to questions in the lab exercises. Write answers to questions at the end of chapters from the text. Use deductive reasoning along with measured properties to identify minerals and rocks. Use map reading skills and deductive reasoning to interpret topographic, geologic, and weather maps.

Out-of-class Assignments

Following earthquake and weather activity using instructor provided websites.

Demonstration of Critical Thinking

From measurements taken and observations made from weather stations, perform weather predictions Use the measuring of physical properties of minerals to identify known minerals Identify unknown rocks by using the texture and observed mineralogy From charts of the sea floor and magnetic readings, reconstruct the evidence for sea floor spreading Analyze topographic and geologic maps

Required Writing, Problem Solving, Skills Demonstration

Write brief answers to questions in the lab exercises Write answers to questions at the end of chapters from the text Use deductive reasoning along with measured properties to identify minerals and rocks Use map reading skills and deductive reasoning to interpret topographic, geologic, and weather maps

Eligible Disciplines

Earth science: Masters degree in geology, geophysics, earth sciences, meteorology, oceanography, or paleontology OR bachelors degree in geology AND masters degree in geography, physics, or geochemistry OR the equivalent. Masters degree required.

Textbooks Resources

1. Required Tarbuck and Lutgens. Earth Science, 14th ed. Pearson Publishing, 2019

Manuals Resources

1. Bud Benneman. Geology 110/106 Lab Book, Golden West College , 08-29-2022