GEOL A106: EARTH SCIENCE FOR TEACHERS

Item	Value
Curriculum Committee Approval Date	12/08/2021
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)
Associate Arts Local General Education (GE)	• OC Physical/Biological Sci - AA (OB)
Associate Science Local General Education (GE)	• OCC Physical/Biological Sci-AS (OSB)
California State University General Education Breadth (CSU GE-Breadth)	• CSU B1 Physical Science (B1) • CSU B3 Laboratory Activity (B3)

Course Description

A broad-based study of earth science, including geology, oceanography, meteorology, and solar system astronomy. Topics are aligned with the California State Science Standards for K-12 and will prepare future teachers to teach these subjects. Transfer Credit: CSU. C-ID: GEOL 121.**C-ID:** GEOL 121.

Course Level Student Learning Outcome(s)

1. Describe the motions of the Earth and Moon through space and how the motion of the Earth relative to the Sun affects seasonal changes and atmospheric heating.
2. Identify specific Earth resources, their uses, and their roles in Earth processes.
3. Describe basic geologic processes and hazards that mark plate tectonic boundaries, basic stream and coastal processes and their impact on humans, and the great range of time scales on the Earth.
4. Describe how ocean currents are generated and redistribute global heat, and how water provides energy for hurricanes.
5. Explain how the Earth's internal processes occur, how the Earth's surface processes occur, how plate tectonics occurs and the results of plate tectonics.
6. Relate how life on earth has evolved over time; how mineral resources have formed and how their extraction and distribution affects humanity; how the Earth's oceans have originated, evolved, and are studied and how the Earth's atmosphere has originated, evolved, and is studied.
7. Describe the occurrence and identification of common minerals and rocks; the origin and nature of geologic hazards: earthquakes, volcanoes, etc.; .the manner in which the history of the Earth and life on Earth occurred; and the manner in which plate tectonics has been responsible for the structure of the Earth's crust and mountain building.
8. Identify the fundamental processes of physical oceanography; the role of plate tectonics with regard to sea floor features; the interactions between atmosphere, hydrosphere, tectonics, and humans; and the fundamentals of meteorology and climatology, and the history of climate.
9. Relate our solar system with planetary science and astronomy to processes, which formed the Earth and made it unique.

Course Objectives

- 1. Demonstrate the basic concepts of weathering, erosion, and soil formation.
- 2. Demonstrate the basic concepts of geologic structures and mountain building.
- 3. Identify 20 common minerals.
- 4. Identify 30 common igneous, metamorphic, and sedimentary rocks.
- 5. Read and interpret topographic maps.
- 6. Read and interpret weather maps.
- 7. Explain how the Earths internal processes operate and occur.
- 8. Explain how the Earths surface processes occur.
- 9. Explain how plate tectonics occurs and the results of plate tectonics.
- 10. Explain and demonstrate to to others how life on earth has evolved over time.
- 11. Explain and demonstrate to others how mineral resources have formed and how their extraction and distribution affects humanity.
- 12. Explain and demonstrate to others how the Earths oceans have originated, evolved, and are studied.
- 13. Explain and demonstrate to others how the Earths atmosphere has originated, evolved, and is studied.
- 14. Explain and demonstrate to others how the Earths atmosphere has originated, evolved, and is studied.
- 15. Explain the occurrence and identification of common minerals and rocks.
- 16. Explain the origin and nature of geologic hazards: earthquakes, volcanoes, etc.
- 17. Explain the manner in which the history of the Earth and life on Earth occurred.
- 18. Explain the manner in which plate tectonics has been responsible for the structure of the Earths crust and mountain building.
- 19. Explain the fundamental processes of physical oceanography.
- 20. Explain the role of plate tectonics with regard to sea floor features.
- 21. Explain the interactions between atmosphere, hydrosphere, tectonics, and humans.
- 22. Explain the fundamentals of meteorology and climatology, and the history of climate.
- 23. Explain the fundamental concepts of astronomy and planetary geology.
- 24. Employ the use of the Scientific Method in understanding the Earths internal and external processes.

Lecture Content

Introduction Employ 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 Reasons for studying Earth Science The Solar System 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 Astronomy Relating Earth to other planets Past tectonic and weathering of rocks on other planets

Method(s) of Instruction

- Lecture (02)
- Lab (04)

Instructional Techniques

Lecture, laboratory, field trip, computer-based assignment

Reading Assignments

1. The students shall, each week, read the following: 1.Selections from the textbook 2.The introduction to each laboratory exercise 3.Handouts given in class

Writing Assignments

1.Write brief answers to questions in the lab exercises2.Write answers to questions at the end of chapters from the text3.Use deductive reasoning along with measured properties to identify minerals and rocks4.Use map reading skills and deductive reasoning to interpret topographic, geologic, and weather maps Examinations will include questions requiring written answers. Written reports will be required.

Out-of-class Assignments

The student, during the course of the semester, shall: 1. Follow earthquake and weather activity at appropriate web sites

Demonstration of Critical Thinking

The students shall, during the semester, undertake the following: 1.From measurements taken and observations made from weather stations, perform weather predictions 2.Use the measuring of physical properties of minerals to identify known minerals 3.Identify unknown rocks by using the texture and observed mineralogy 4.From charts of the sea floor and magnetic readings, reconstruct the evidence for sea floor spreading 5.Analyze topographic and geologic maps

Required Writing, Problem Solving, Skills Demonstration

Each week the student shall do one or more of the following: 1.Write brief answers to questions in the lab exercises 2.Write answers to questions at the end of chapters from the text 3.Use deductive reasoning along with measured properties to identify minerals and rocks 4.Use map reading skills and deductive reasoning to interpret topographic, geologic, and weather maps

Textbooks Resources

1. Required Tarbuck, E. S., Lutgens, F., and Tasa, D. Earth Science, 13th ed. New York: Prentice Hall, 2011 Rationale: . 2. Required Tarbuck, Lutgens, Tasa, Pinzke. Lab Manual: Applications and Investigations in Earth Science, 8th ed. New Jersey: Pearson, 2014

Other Resources

1. Videos: Earth Revealed series, fourteen ½-hour programs Planet Earth, five 1-hour programs