Laboratory Contact Hours: 48-54; Homework Hours: 0; Total Student Learning Hours: 48-54

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

GEOLOGY 111 – PLANET EARTH LABORATORY

3 hours laboratory, 1 unit

Catalog Description
Physical science laboratory course to accompany and augment GEOL 110. Includes laboratory and field investigations of the Earth, emphasizing hands-on experience with minerals, rocks and landforms, as well as topographic and geologic maps.

Prerequisite
"C" grade or higher or "Pass" in GEOL 110 or equivalent or concurrent enrollment

Entrance Skills
Without the following skills, competencies and/or knowledge, students entering this course will be highly unlikely to succeed:
1) Working knowledge of the Theory of Plate Tectonics as it relates to sea floor spreading, subduction, continental drift and the evolution of ocean basins, continents and mountains.
2) Introduction to the scientific method and the principle of uniformitarianism.
3) Basic interpretation of geologic, topographic and geospatial data on maps, tables and graphs.
4) Recognition of basic rock forming elements and minerals, and the common rocks they form.
5) Identification of Earth's internal structure and material characteristics, including heat exchange within and between layers.
6) Introduction to seismology and volcanology, and the common landforms they create.
7) Patterns of weathering, erosion and mass wasting, and geologic hazards assessment.
8) Overview of geologic time, including analysis of relative and absolute dating methods.

Course Content
1) The scientific method, including hypothesis development, testing, and analysis
2) Identification and classification of common minerals and rock types
3) Modeling of rock forming processes and the rock cycle
4) Geologic patterns and processes related to plate tectonics and uniformitarianism
5) Measurement and analysis of volcanic and tectonic processes and landforms
6) Composition and characteristics of the Earth's crust and interior
7) Analysis of the origin and evolution of ocean basins, continents and mountains
8) Structural geology and landform interpretations
9) Analysis and interpretation of geologic and topographic maps, and remotely sensed images
10) Identification and interpretation of weathering, erosion and mass wasting processes
11) Analysis of fluvial, aeolian, glacial and coastal processes and landforms
12) Identification and analysis of geologic hazards such as earthquakes, volcanic eruptions, landslides, tsunamis and floods, and their effects on human activities
13) Modeling of groundwater and its effect on soil, mineral and rock formations
14) Analysis and application of relative and absolute dating methods
15) Assessment of global, regional and local environmental concerns as relevant to lab topics

Course Objectives
Students will be able to:
1) Use the scientific method to develop, test and analyze basic geologic hypotheses in a laboratory setting.

2) Apply the guiding principles of plate tectonics and uniformitarianism to analyze and interpret basic geological patterns and processes.
3) Analyze geologic, topographic and geospatial data on maps, tables and graphs, and draw conclusions based on subsequent interpretations.
4) Construct simple maps and structural diagrams using baseline topographic, cross-section and stratigraphic data.
5) Use physical characteristics such as color, texture and hardness to identify common minerals and the rocks that they form.
6) Model the rock cycle and explain the endogenous and exogenous processes that drive change within this cycle.
7) Apply the Theory of Plate Tectonics to model sea floor spreading, subduction and continental drift, and the motions and interactions of Earth's lithospheric plates.
8) Apply relative and absolute dating methods to construct geologic histories of specific formations.
9) Describe the development and evolution of common landforms within the context of the geologic and geomorphic setting.
10) Recognize geologic hazards for a given landscape, evaluate their potential for causing damage, and identify strategies for preventing natural disasters.

Method of Evaluation
A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in subject matter determined by multiple measurements for evaluation, one of which must be essay exams, skills demonstration or, where appropriate, the symbol system.
1) Laboratory experiments and written exercises that measure the student's ability to use the tools of geology to analyze, interpret, and draw conclusions about modern and historical geological patterns and processes.
2) Hands-on lab practice in which students develop the necessary skills for identifying common rocks and minerals.
3) Mapping and structural modeling assignments in which students are required to utilize geospatial/structural data to analyze regional and/or local landscapes in order to identify basic landforms, structural patterns, and environmental hazards within the context of a specific geological setting.
4) Quizzes/exams that measure the student's ability to analyze and interpret data, and explain geologic patterns and processes based on lab experiments, exercises and practice.

Special Materials Required of Student
None

Minimum Instructional Facilities
1) Smart classroom with writing board, LCD and overhead projectors/screen, computers with Internet access
2) Wall maps illustrating global/regional scale physical geography and geology phenomena at Earth's surface (e.g., physiography, geology, ocean basins, plate tectonics, etc.)
3) Physiographic globe and topographic maps
4) Hand samples of common rocks and minerals

Method of Instruction
1) Integrated classroom lecture, discussion and demonstration
2) Practical laboratory experiments and exercises
3) Field trips designed to link course materials to real world phenomena
4) Instructional slides and audio/video presentations
5) Auxiliary use of study groups, peer tutoring and/or instructional office hours

Out-of-Class Assignments
1) Reading assignments
2) Written lab reports

Texts and References
1) Required (representative example): Tems, Caitlin. *GEOL 111 Physical Geology Lab Manual*. 2018.
2) Supplemental: As assigned by instructor

Student Learning Outcomes
Upon successful completion of this course, students will be able to:
1) Apply the process of scientific inquiry to draw conclusions about the Earth system and explore human influence on it.