

GEOLOGY

Prerequisite: Completion of IS1/2 with a "C" or better

Geology AB is a full-year college preparatory class that meets the University of California and the California State University requirement for laboratory science. Geology is also known as geoscience or Earth science. It is the study of the structure, evolution and dynamics of the Earth and its natural mineral and energy sources. Geology investigates the processes that have shaped the Earth through its ~4.6 billion year history using various lines of evidence such as the rock record to unravel its story. This course emphasizes critical thinking, problem solving, laboratory investigations and independent measurement techniques. The course will cover scientific notation, dimensional analysis, atomic structure and theory, the periodic table, nebular theory, plate tectonic theory, rock cycle, weathering and erosional processes, seismic and volcanic hazards and energy resources. Students are required to pass the first semester in order to enroll in the second semester.

Understanding and Knowledge

- Measurements and calculations including dimensional analysis, significant figures, accuracy and precision, percent error, and density.
- Describe what science is and apply the scientific approach to problem solving.
- Understand states of matter and physical changes.
- Identify common minerals based on their physical properties.
- Identify common rocks and interpret the tectonic/environmental conditions under which they were formed.
- Locate and identify basic features on topographic maps.
- Describe the current model of earth's physical and chemical layering, including evidence that supports this model.
- Describe the theory of plate tectonics, including evidence that supports this theory.
- Identify the tectonic processes responsible for creating mountain ranges, basins and other features on the earth's surface.
- Identify the tectonic processes responsible for creating earthquakes and various types of volcanic activity.
- Describe the various surface processes responsible for the evolution of the earth's surface.
- Interpret the geologic history of an area, based upon geologic structure as well as rock types and fossils present in the geologic column.
- The formation of the universe, the solar system and the Earth
- Earth's internal structure and plate tectonics
- Examining and implementing atomic knowledge, to matter, minerals and rocks
- Detecting various types of volcanism and igneous processes
- Measuring and assessing earthquakes and seismicity
- Examining mountain building and continental accretion
- Identifying and interpreting weathering and erosional processes
- Understanding uniformitarianism and other principles key for interpreting geologic time
- Examine various river processes and the production of groundwater
- Prediction of landslides and mass wasting
- Argument driven discussions concerning glaciers, sea level rise and climate change
- Explore wind, deserts, and shoreline processes
- Reflect on the management and usage of energy resources
- Discuss scientific and technological advances and their relationship to the modern world.
- Understand the role of geology in our daily lives.

Skills

Students will be able to:

- Use the scientific process.
- Use the scientific method to solve problems.
- Use the metric system.
- Design and conduct research through scientific and laboratory investigations using qualitative and quantitative measurements.

- Exhibit, organize and present the results and conclusions of experiments and research
- Use problem-solving skills to conduct laboratory investigations and incorporate research of current scientific literature and other sources of information into these projects.
- Use scientific equipment.
- Demonstrate proficiency in the usage of laboratory equipment.
- Demonstrate the usage of technological equipment.
- Analyze and understand scientific concepts.
- Apply critical thinking and problem-solving skills in order to analyze mathematical, statistical and scientific data.
- Identify objective scientific evidence and evaluate the advantages and disadvantages of different solutions to a problem.
- Demonstrate, analyze and reflect upon personal and social responsibility to the world as an informed and conscientious citizen.
- Identify and explain science as a human endeavor wherein teams of scientists work
- Work together on personal and social perspectives in an effort to understand the world around them.
- Communicate effectively and appropriately in oral and written form.

Assessment & ESLRs

Students will:

- Form hypotheses and conclusions based on observations, explanations, models and predictions consistent with evidence while continually re-evaluating those hypotheses as new evidence is discovered.
- Design and use tables, graphs, charts and written analyses to communicate findings and conclusions obtained from collected data while comparing and contrasting other conclusions based on the same data.
- Investigate scientific phenomena through laboratory investigations and research done independently and as a group by identifying variables which could affect experimental results.
- Explore geology with actual field work
- Appropriately demonstrate and use scientific instruments and technology to collect, organize and analyze data.
- Study and evaluate various solutions to challenges facing communities, using concepts of geology and distinguish between opinions and appropriate scientific data.