

**College: CLAS**

**Department: Geology**

**Degree: B.A./B.S. in Earth Science**

### **Introduction**

The Department of Geology offers programs leading to the bachelor's degree in geology and earth science, as well as studies in numerical modeling, geochemistry, geomicrobiology, glaciology, hydrogeology, engineering geology, planetary geology, and environmental geology.

The programs serve both majors in geology and earth science and nonmajors: those who may wish to broaden their science background; those preparing to teach general or earth sciences or geology in elementary or secondary schools; and those preparing for a master's or a doctoral degree.

Postbaccalaureate students (with a bachelor's degree, not in geology) who wish to become professional geologists may complete this curriculum while doing both undergraduate and graduate work in geology.

Geologists are employed by government agencies at federal, state, county, and city levels; by independent consulting firms to work with engineers, architects and planners; in the construction, mining, and petroleum industries; and as teachers in elementary and high schools and at the college level.

Geologists who have graduated from PSU are employed as researchers in mitigation of environmental problems, assessment of ground and surface water resources, exploration, development and management of mineral and fuel resources, urban planning, GIS, evaluation of the effects of forest roads and quarries on watershed health, management of their own companies, and instruction at all educational levels.

Students majoring in geology and earth science should plan to complete the required mathematics, chemistry, and physics courses as early in their program as possible.

### **Undergraduate Program Learning Outcomes**

Knowledge #01: Students will be able to identify rocks and minerals and know their genesis and usage.

Knowledge #02: Students will be able to delineate landforms and know their development and characteristics.

Knowledge #03: Students will demonstrate an understanding of plate tectonic theory.

Knowledge #04: Students will demonstrate an understanding of Earth's history and the evolution of Earth's geological systems.

Knowledge #05: Students will demonstrate an understanding of the principles of structural geology.

Knowledge #06: Students will demonstrate an understanding of stratigraphy and the process of sedimentation.

Knowledge #07: Students will recognize the current and historical role of geology on society, the economy and the environment.

Knowledge #08: Students will demonstrate an understanding of geological hazards.

Knowledge #09: Students will recognize the relationships between Geology and other disciplines.

Knowledge #10: Students will demonstrate an understanding of and be able to model physical and chemical processes in earth systems.

Skills #01: Students will be able to apply statistics to geological data.

Skills #02: Students will be able to apply computer skills relevant to Geology, including the use of databases, statistical and graphic software, and Geographic Information Systems (GIS).

Skills #03: Students will be able to apply mathematics to describe geological phenomena.

Skills #04: Students will be able to summarize, analyze, and perform quality control on geological data.

Skills #05: Students will be able to communicate in writing effectively and in an organized manner according to the disciplinary conventions in Geology.

Skills #06: Students will be able to articulate and pursue geological research problems.

Skills #07: Students will be able to conduct projects based primarily on observation skills, including field data collection, analysis, synthesis, evaluation and explanation.

Skills #08: Students will be able to conduct projects based primarily on literature research.

Skills #09: Students will be able to perform clearly organized oral presentations with effective visual aids.

Skills #10: Students will be able to read maps effectively, including topographic and geologic maps, GIS, and DEM's.

Skills #11: Students will be able to perform essential field skills, including rock identification, stratigraphy, structures, strike, dip, GPS, and surveying techniques.

Skills #12: Students will be able to execute group projects effectively.

Skills #13: Students will be able to develop models to present geological data.

Skills #14: Students will be able to apply GIS effectively.

Skills #15: Students will be able to use geological instruments effectively.

Skills #16: Students will demonstrate an understanding of ethics and social responsibility on relation to Geology.

Skills #17: Students will demonstrate creative and critical thinking in relation to Geology.

Skills #18: Students will demonstrate an understanding of internationalization in relation to Geology.

Skills #19: Students will demonstrate an understanding of diversity in relation to Geology.

Skills #20: Students will demonstrate an understanding of engagement in relation to Geology.

Skills #21: Students will demonstrate an understanding of sustainability in relation to Geology.