

# GEOLOGY

What can I do with this major?

| AREAS                                                                                                                                                                                                                                                                                                                                            | EMPLOYERS                                                                                                                                                                                                                                                                                                                                                                                                                                  | DESCRIPTIONS/STRATEGIES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| <p><b><u>RESOURCES</u></b><br/> <b><i>Energy (Coal, Oil, Gas, &amp; Other Energy Sources)</i></b><br/>           Stratigraphy<br/>           Sedimentology<br/>           Structural Geology<br/>           Geophysics<br/>           Economic Geology<br/>           Geomorphology<br/>           Paleontology<br/>           Fossil Energy</p> | <p>Petroleum industry including oil and gas exploration, production, storage, and waste disposal facilities<br/>           Independent drilling companies<br/>           Federal government agencies such as:<br/>               Department of Energy<br/>               Bureau of Land Management<br/>           State government<br/>           Private companies<br/>           Consulting firms<br/>           Equipment suppliers</p> | <p><i>Geologists working in the area of energy use various methods to determine where energy sources are accumulated.</i><br/>           Because geologists often work closely with engineers, obtain some knowledge in engineering to aid communication.<br/>           Gain knowledge of computer modeling and Global Positioning System (GPS). Both are used to locate deposits.<br/>           Many geologists in this area of expertise work with oil and gas and may work in the geographic areas where deposits are found: Texas, Oklahoma, Louisiana, California, offshore sites, or overseas in oil-producing countries.<br/>           This industry is subject to fluctuations, so be prepared to work on a contract basis.<br/>           Develop excellent writing skills to publish reports and to solicit grants from government, industry, and private foundations.<br/>           In order to manage projects, obtain management and leadership experience.</p> |

## ***Minerals***

Mining Geology  
 Mineralogy  
 Geochemistry  
 Economic Geology  
 Paleontology  
 Stratigraphy  
 Sedimentology  
 Crystallography

Mining Companies  
 Consulting Firms  
 Federal government agencies such as:  
     Bureau of Mines  
     Office of Surface Mining  
     Bureau of Land Management  
 Coal companies  
 Well services and drilling companies  
 Construction firms  
 Quarries  
 Railroad companies

*Geologists who are focused in the mineralogy or mining geology area are interested in locating the accumulations of minerals or metals within the earth's crust.*  
 Become familiar with environmental regulations and government permit issues.  
 Mining geologists rely heavily on the computerized Geologic Block Model to learn about a mineral deposit, so computer literacy is essential.

| AREAS                                                                                                                                                       | EMPLOYERS                                                                                                                                                                                          | DESCRIPTIONS/STRATEGIES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| <b>LANDSCAPE</b><br><b><i>Environmental Geology</i></b><br>Sedimentology<br>Hydrology<br>Geomagnetism<br>Earth Surface Dynamics<br>Coastal & Marine Geology | Federal government agencies such as:<br>Environmental Protection Agency<br>Forest Service<br>Army Corps of Engineers<br>US Geological Survey<br>Bureau of Land Management<br>Department of Defense | <i>Geologists in this category may focus on studying, protecting, and reclaiming the environment.</i><br>Obtain a great deal of lab experience.<br>Consider obtaining a double major in physics because of the geophysical nature of this concentration area.<br>Develop excellent written and public speaking skills.<br>Gain a thorough understanding of federal and state government guidelines for the management of solid, liquid, and gaseous waste.<br>Consider a law degree for work with land-use laws and legal matters.                                                                          |
| <b><i>Geologic Mapping</i></b>                                                                                                                              | Federal government agencies such as:<br>US Geological Survey<br>Department of Defense<br>Private companies                                                                                         | <i>Geologists interested in geologic mapping collect, process, analyze, translate, and disseminate earth-science information through geologic maps.</i><br>Obtain excellent computer and technical skills because much mapping is now digitized.<br>Gain experience in surveying through internships or academic opportunities.                                                                                                                                                                                                                                                                             |
| <b><i>Astrogeology &amp; Space Sciences</i></b>                                                                                                             | Federal government agencies such as:<br>National Aeronautics and Space Association (NASA)<br>US Geological Survey                                                                                  | <i>Geologists involved in astrogeology may participate in processing and analyzing data from various missions to planetary bodies in our solar system, assisting in finding potential landing sites for exploration vehicles, mapping our neighboring planets and their moons, and conducting research to better understand the origins, evolutions, and geologic processes operating on these bodies.</i><br>Work in this area often requires many years of experience and developed research. A PhD is often required.<br>Develop extraordinary analytical writing skills for grant writing and research. |

| AREAS                                                                                                                                            | EMPLOYERS                                                                                                                                                                             | DESCRIPTIONS/STRATEGIES                                                                                                                                                                                                                                                                                                                                               |
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| <b>HAZARDS</b><br><b>(Earthquakes, Volcanoes, Landslides, Floods)</b><br>Seismology<br>Tectonophysics<br>Geomagnetism<br>Global Seismic Networks | Federal government agencies including:<br>National Oceanic and Atmospheric Administration<br>US Geological Survey<br>Department of Defense<br>Private research groups and foundations | <i>Geologists involved in this area focus on the detection of hazards and the effects of hazards on the landscape.</i><br>Gain experience in technical mapping such as digital terrain modeling.<br>Consider an additional major in physics or take additional geophysics courses.<br>Gain some knowledge in engineering.<br>Develop presentation and writing skills. |
| <b>EDUCATION</b><br>Teaching<br>Research<br>Administration                                                                                       | Elementary/secondary public or private schools<br>Colleges and universities<br>Museums                                                                                                | Obtain certification/licensing for public school teaching.<br>Obtain Ph.D. for higher education teaching and/or advanced research and administrative positions.<br>Develop grant writing skills.<br>Become familiar with Geographic Information Systems (GIS).                                                                                                        |

### **GENERAL INFORMATION**

- Within the many facets of geology, there is often overlap of job functions. However, many geologists find advantage in becoming more specialized.
- Gaining experience is very important and there are many opportunities for students to obtain volunteer, part-time, summer, internship, and/or co-op experiences in different geological fields.
- A bachelor's degree may be sufficient for entry-level industry positions.
- A master's degree is often preferred for state survey work and advancement in industry and government.
- Employment prospects are best for those with master's degrees, familiarity with advanced technologies such as computer modeling, and willingness to relocate.
- Plan on completing a state exam to become a registered geologist.
- Obtain experience in mapping and surveying. Develop skills with measuring equipment as well as laboratory equipment and processes.
- Obtain a business background to help in managing projects and assessing economic costs and benefits.
- Have a love of the outdoors, an interest in nature, and a desire to travel.
- Join groups directed toward improvement of natural resources, environment, and pollution control.
- Develop exceptional computer skills.
- Join the student branch of the professional organization(s) related to interest area(s).
- Learn a foreign language since work may often be done in other countries.
- Develop physical stamina to work and do research in remote areas under various conditions.
- Excellent verbal and written communication skills are essential. The ability to market your skills and write proposals is necessary to maintain steady work. The ability to obtain grants may be necessary to continue a project.