

EARTH SCIENCE

What can I do with this major?

AREAS

ANY ENGINEERING DISCIPLINE

Research and Development
Design
Production
Operations
Management
Teaching
Consulting
Sales and Marketing
Law
Manufacturing
Healthcare

EMPLOYERS

Engineering companies
Consulting companies
Industry
Local, state and federal government
Colleges and universities

STRATEGIES

Obtain relevant experience through co-ops or internships for industry-related career.
Develop strong verbal, written, teamwork and problem-solving skills.
Pursue Master of Science (MS), Master of Engineering (ME), or Master of Business Administration (MBA) degrees for increased opportunities in technical management.
Obtain Ph.D. for teaching and research careers.
Learn federal, state and local government job application procedures.
Pursue Professional Engineering licensure.

EDUCATION

Teaching Research

Elementary/secondary public or private schools
Colleges and universities
Museums

Explore opportunities for undergraduate research.
Develop strong communication skills, both oral and written.
Seek volunteer or paid experiences, such as camp counselor or tutor, with target age group.
Obtain certification/licensing for public school teaching, which varies by state. Acquire multiple certifications for increased employability in secondary education.
Complete a master's degree for community college teaching.
Pursue Ph.D. for college/university teaching and research. Grant writing skills are essential in academia.

ENERGY (Oil, Coal, Gas, Other Energy Sources)

Stratigraphy
Sedimentology
Structural Geology
Geophysics
Geochemistry
Economic Geology
Geomorphology
Paleontology
Fossil Energy
Hydrogeology

Petroleum industry including oil and gas exploration, production, storage and waste disposal facilities
Coal industry including mining exploration, grade assessment and waste disposal
Federal government agencies:
National Labs
Department of Energy
Bureau of Land Management
Geologic Survey
State government
Consulting firms
Well services and drilling companies
Oil field machinery and supply companies

Geologists working in the area of energy use various methods to determine where energy sources are accumulated. They may pursue work tasks including exploration, well site operations and mudlogging.
Seek knowledge in engineering to aid communication, as geologists often work closely with engineers. Coursework in geophysics is also advantageous for this field.
Gain experience with computer modeling and Global Positioning System (GPS). Both are used to locate deposits.
Many geologists in this area of expertise work with oil and gas and may work in the geographic areas where deposits are found including offshore sites and in overseas oil-producing countries.
This industry is subject to fluctuations, so be prepared to work on a contract basis.
Develop excellent writing skills to publish reports and to solicit grants from government, industry and private foundations.
Obtain leadership experience through campus organizations and work experiences for project management positions.

AREAS

EMPLOYERS

STRATEGIES

ENVIRONMENTAL GEOLOGY

Sedimentology
Hydrogeology
Shallow Geophysics
Coastal and Marine Geology
Geochemistry
Oceanography
Environmental Geology

Federal government agencies:
National Labs
Environmental Protection Agency
Forest Service
Army Corps of Engineers
Geological Survey
Bureau of Land Management
Department of Defense
State highway departments
Public utilities companies
Mines
Environmental consulting firms
Water testing labs
Land use planning agencies
Civil engineering firms
Surveying companies

Geologists in this category may focus on studying, protecting and reclaiming the environment.
Obtain lab experience through coursework, research with professors and internship programs related to environmental geology.
Consider additional courses in environmental studies, biology and physics to complement this concentration.
Develop excellent written and speaking skills, particularly for interest in public policy.
Gain a thorough understanding of federal and state government guidelines for the management of solid, liquid and gaseous waste. Investigate certification programs for Hazardous Waste Operations and Emergency Response Standard (HAZWOPER).
Consider earning a law degree for work with land-use laws and legal matters.

GEOLOGIC MAPPING

Structural Geology
Stratigraphy
Sedimentology
Remote Sensing
Geophysics

Federal government agencies:
US Geological Survey
Department of Defense
Private companies

Geologists interested in geologic mapping collect, process, analyze, translate and disseminate earth-science information through geologic maps.
Pursue experience reading maps and interpreting data sources including geological surveys and satellite images.
Learn about surveying through part-time jobs, internships or academic opportunities.
Develop attention to detail and excellent technical skills to utilize geologic and spatial mapping programs.
Gain experience with modeling and Geographic Information Systems (GIS).

AREAS

EMPLOYERS

STRATEGIES

HAZARDS

ENGINEERING GEOLOGY

Seismology
Volcanology
Geomorphology

GEOLOGIC ENGINEERING

Civil Engineering
Environmental Geology
Structural Geology

Federal government agencies:
National Oceanic and Atmospheric Administration
Geological Survey
Department of Defense
Private research groups and foundations
Consulting firms

Geologists in this area focus on the detection of hazards such as earthquakes, volcanoes, landslides, floods and tsunamis and the effects of these hazards on the landscape.

Gain experience in technical mapping such as digital terrain modeling; a high degree of computer skills is expected.

Consider an additional major or minor in physics, geophysics and/or engineering; knowledge of engineering is essential.

Develop excellent writing and presentation skills and be willing to travel to conduct research.

Prepare to work with teams of scientists and other staff in the field for extended periods.

Research Fundamentals of Engineering (FE) exam requirements, as this is typically the first step in becoming a Professional Engineer (PE).

Professional Engineer (PE) licensing guidelines vary by state. Check with the National Council of Examiners for Engineering and Surveying (NCEES) for links to state boards.

Obtain Ph.D. for research and administrative opportunities.

MINERALS

Mining Engineering
Mineralogy
Geochemistry
Economic Geology
Paleontology
Stratigraphy
Sedimentology
Crystallography

Geological exploration firms
Mining companies
Consulting firms
Federal government agencies:
Geologic Survey
Office of Surface Mining, Reclamation and Enforcement
Bureau of Land Management
Railroad companies
Well services and drilling companies

Geologists who study mineralogy or mining geology area are interested in locating the accumulations of minerals or metals within the earth's crust. They may pursue work tasks including exploration, well site operations, mine design, reclamation and groundwater management.

Become familiar with environmental regulations and government permit issues.

Consider specializing in a particular mineral or metal to build an area of expertise.

Secure experience in the field through part-time positions and internships.

Seek opportunities to develop strong technical skills, as mining geologists rely heavily on computerized models to learn about mineral deposits.

GENERAL INFORMATION

- Utilize Sloan Career Cornerstone Center's website to learn more about opportunities in engineering.
- A bachelor's degree provides a wide range of career opportunities in industry, business and government.
- Bachelor's degree is good background for pursuing technical graduate degrees as well as professional degrees in Engineering, Business Administration, Medicine or Law.
- Graduate degrees offer more opportunities for career advancement, college or university teaching positions.
- Related work experience obtained through co-op, internships, part-time or summer jobs is extremely beneficial.
- Develop excellent verbal and written communications skills including presentation and technical report writing. Learn to work well on a team to maximize collaborations with other engineers and those outside of the profession.
- Develop computer expertise within field.
- Engineers need to think in scientific and mathematical terms and exhibit the abilities to study data, sort out important facts, solve problems and think logically. Creativity is useful.
- Other helpful traits include intellectual curiosity, technical aptitude, perseverance and a basic understanding of the economic and environmental context in which engineering is practiced.
- Because of rapid changes in most engineering fields, both continued education and keeping abreast of new developments are very important.
- Join relevant professional associations, attend meetings, participate in design competitions and stay up-to-date on research/publications.
- All states and the District of Columbia require registration of engineers whose work may affect the life, health or safety of the public.
- Professional or technical societies confer certification in some areas.
- Research Fundamentals of Engineering (FE) exam requirements, as this exam is typically the first step in becoming a Professional Engineer (PE).
- Professional Engineer (PE) licensing guidelines vary by state. Check with the National Council of Examiners for Engineering and Surveying (NCEES) for links to state boards.
- Become familiar with the federal job application and employment procedures.

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