

GEOLOGY

<http://cos.gmu.edu/academics/undergraduate/majors/geology>

Name and description of the field

Geology is the theoretical and practical application of scientific disciplines to the study of the earth. Geologists are constantly doing research to develop new principles, which may help their understanding of how the earth has changed through time. Also, these principles can often be applied to the discovery of new resources. Research positions are available to geologists in most large energy companies, mineral companies, geological surveys, universities and colleges. Principles about how the earth has developed have now been applied to help us understand the formation and composition of other planets, and our development of these planets will rely on the exploration skills of geologists now studying such remote areas as oceans floors or the ice-covered polar regions of our planet.

The degree program in Geology at George Mason University provides students with a comprehensive group of courses in the principal disciplines of earth sciences. The major is designed to give students basic concepts across the spectrum of geological experiences. At the same time, non-geology students have an opportunity to explore natural science through introductory and special interest courses.

What special skills or abilities are needed to succeed in this major?

As in all sciences, the abilities to observe, measure, quantify, think logically and analytically, and communicate effectively are all necessary skills. Visualization and reconstruction of 3-dimensional structures are essential skills. The laboratory of the earth scientist may be indoors but is commonly out of doors; therefore the ability to work efficiently outside is important. Previous majors have supplemented their geology background with course work in cartography, remote sensing, computer science, environmental science, and engineering.

If both B.A. and B.S. degrees are offered, what are the differences in career/graduate school opportunities?

The B.A. degree in Geology is recommended for students who have a more casual interest in geology/earth science and who will not pursue careers that demand an extensive math and science background.

A B.S. degree in Earth Systems Science with a specialization in Geology is available for those who are interested in a more science- and math-based curriculum (see Earth Systems Science).

Is it possible to minor in Geology or Earth Science?

Yes. A minor in Geology would consist of introductory courses in both Physical & Historical Geology, Mineralogy and require an additional 8 credit hours. For Earth Science, courses needed are Physical Geology, Meteorology, Oceanography, and 8 credits in Geology electives.

What are recent graduates doing?

Graduates with bachelor's degrees have had moderate success finding employment in industry and government agencies, and are employed in a support capacity for senior scientists (field personnel, lab technicians, etc.). Industrial employment is most promising in the fields of engineering, hydrology, and environmental science. Jobs in the traditional geological fields of mining and oil and gas exploration are much more difficult to obtain. As in all sciences, career opportunities are greatly increased for individuals with advanced degrees. Graduates who have pursued M.S. and Ph.D. degrees enjoy promising and challenging careers in government agencies, industry, and academia.

Sample job titles include:

Geological aide	geophysical prospector	Engineering
geologist	environmental aide	Hydrology
soils engineer	environmental engineer	Environmental scientist
stratigrapher	mineralogist	

Organizations employing recent Geology graduates include:

U.S. Geological Survey	Defense Mapping Agency
U.S. Department of Agriculture	PRC, Inc
Virginia Department of Transportation.	

EXPLORING MAJORS

Geology: Sample job descriptions for Candidates with a Bachelor's Degree:

Earth Sciences Intern—Reston, VA Description: The climate History /Hazards Team requires intern with experience in the geosciences and with a preferred interest in climate research and study of sea level change. The project requires fieldwork, lab work, and on-site use of U.S. government computer systems. Intern will acquire knowledge in field sampling techniques, preparation of core and sediment samples for litho logic and paleontologic studies. In addition, the intern will use graphics hardware and software to produce computer generated illustrations.

Specific Qualifications Required:

- Completion of all requirements for a bachelor's degree with GPA of 2.9 on 4.0 scale or 30 semester hours of graduate credit;
- Background in geology or geography;
- Knowledge of operation of desktop PC's including Windows environment;
- Knowledge of operation of professional illustration packages such as Illustrator, Photoshop, or CorelDraw.

Additional Qualifications Desired:

- Experience in field methods for collecting geologic samples;
- Experience in laboratory studies involving sediment analysis.

Field Hydro geologist/Environmental Technician – Sterling, VA. Description: A leading construction/environmental services firm is recruiting workers to perform field services such as well installations, surveying, remedial system compliance sampling and sub-surface investigations. Bachelors degree in environmental science, geology or water resources is preferred.

Hydrographer – Consulting architectural and engineering firm in Fairfax, VA, seeks an individual to provide technical support for the revision, creation, and application of Flood Insurance Studies (FIS) and Flood Insurance Rate Maps (FIRMS). Organize and oversee all aspects related to the processing of FIS and FIRM revisions and creations; coordinate with Federal officials to establish budgets; and resolve technical issues associated with FIS processing. Requires excellent communication skills; good cartography sense; ability to handle multiple projects simultaneously; and bachelor's degree in geography, geology, or environmental science.

Resources for further information:

A key element in effective decision making is having sufficient information about the major or career being explored. Sources of information include people in the field, professional associations relating to the field, faculty and your career services counselor. Below are additional resources to aid in exploration:

Printed Resources (Career Services Library, 348 SUB1)

http://careers.gmu.edu/careerlibrary/wheretostart/geol_esci_evsp.pdf

Online Resources: <http://careers.gmu.edu/onlineresources/geol.htm>

Science Related Job/Internship Postings: <http://cos.gmu.edu/students/careerservices> & <http://www.aaas.org/careercenter/> & http://green.gmu.edu/for_students/internships.html & - <http://www.ecojobs.com/index.php>

Networking Resource: <http://www.mentornet.net/>

Professional Associations:

- **American Association for the advancement of Science** - <http://www.aaas.org/>
- **The Geological Society of America** - <http://www.geosociety.org/>
- **Mason Student Clubs/Orgs/Societies Science and Technology Umbrella** - http://sa.gmu.edu/student_orgs/orgs.php#stu

What kinds of practical experience are recommended to explore Geology careers further?

Practical experience can be obtained through student research projects, summer jobs, internships and co-op. Many students hold part-time jobs at the U.S. Geological Survey. Practical experience of this sort greatly improves one's chances of finding meaningful employment after graduation. Consult faculty, department bulletin boards, and online and printed resources cited above.

Whom should students contact for further information?

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