EARTH SCIENCE

http://cos.gmu.edu/academics/undergraduate/majors/earth_science

Name and description of the field.
Earth Science (ES) investigates Earth's major systems, including the lithosphere (solid earth), hydrosphere, atmosphere, and ecosphere. Geology, on the other hand, is a field concerned primarily with the solid earth, its materials, processes, and historical development. Earth Science B.S. majors will receive a background in the basic sciences, including all of Earth's systems. ES majors must concentrate in either Geology, Earth and Space Science (for secondary school teachers) or Geoarchaeology. Other specialty options will be added over the next few years. A B.A. degree in Geology (see Geology major) is also available for students who wish to study the solid earth, without having to do background study of other earth systems.

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 earth science background with coursework 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.S. degree in Earth Science is recommended for students who anticipate graduate study or who intend to pursue careers in earth science-related areas. The B.S. degree will provide necessary background in math and other sciences.

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.

What are recent graduates doing?
Graduates with bachelor's degrees have had moderate success finding employment in industry and government agencies, and are also employed in a support capacity for more senior scientists (field personnel, lab technicians, etc.).
Occupations include: Assistant Professors, Biotech, Environmental Scientists, Policy Analysts, Research Fellows, and Watershed Specialists. 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.
Recent graduates are working in agencies such as: the Caribbean Central American Action, Logistics Management Institute, Northern Virginia Soil and Water Conservation District, NVCC, United States Environmental Protection Agency, US Department of Energy, the American Type Culture Collection and the Back Bay National Wildlife Refuge.

As in all sciences, career opportunities are greatly increased for individuals with advanced degrees. Our graduates who have pursued M.S. and Ph.D. degrees enjoy promising and challenging careers in government agencies, industry, and academia.

Earth Science: Sample job description for Candidate 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 lithologic 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

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/esci.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/
- **American Geological Institute** - http://www.agiweb.org
- **U.S. Geological Survey** - http://www.usgs.gov
- **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 Earth Science 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.

Is it possible to minor in Earth Science?
No, but a minor is available in Geology. Earth Science and Geology majors would benefit from minors in Math, Chemistry, Physics, and Computer Science.

Whom should students contact for further information?

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