

# GEOLOGY (GEOL)

Graduate Degree Program

College: Computer, Mathematical, and Natural Sciences

## Abstract

The Department of Geology offers programs leading to the M.S. and Ph.D. degrees. On a full time basis, the M.S. normally requires two to three years of work, which includes courses, the completion of an M.S. research thesis, and an oral defense of the thesis. On a full time basis, the Ph.D. commonly requires three to four years of work, if conducted after the completion of an M.S. program, or four to five years from the time of admission if pursued directly from the Bachelor level. The Ph.D. program normally includes course work, a qualifying examination and proposal defense, a dissertation, and an oral defense and examination of the dissertation.

Our students are required to engage in independent and original research under a mentoring program that promotes creative thinking. This is most commonly achieved via the collaboration between students and faculty in ongoing research programs. Geology is concerned with the Earth, its origin and evolution and the origin of life, and the processes by which Earth's atmosphere, surface and interior have been and continue to be modified. To pursue these topics we have developed research strengths in four themes: Geochemistry, which involves investigations of low- to high-temperature processes operating from Earth's surface to its core and within the Solar System; Solid Earth Science, which is the study of the minerals, rocks, and structures that constitute Earth, and the tectonic and other processes by which they are formed and altered; Surficial Processes and Environments, which involves the study of active and past fluxes (and reservoirs) of water, dissolved components, and sediment on Earth's surface and the interactions of these fluxes with the biosphere and atmosphere; and, Geophysics, which includes investigations of Earth's interior structure and dynamics, as well as planetary physics. These areas are not mutually exclusive, and students are encouraged to develop a program that suits their interests. Developing areas within the Department include planetary geology and forensics.

Although students will choose an advisor within the Department of Geology, they may also wish to take advantage of research opportunities provided by collaboration with other departments on campus, such as Mathematics, particularly the Applied Mathematics and Scientific Computation Program (AMSC), Atmospheric and Oceanic Science, Physics, Geography, and Chemistry, as well as other institutions in the area including the Smithsonian Institution, United States Geological Survey, NASA, Department of Terrestrial Magnetism, Geophysical Lab and National Institute of Standards and Technology. The Earth System Science Interdisciplinary Center is a collaborative venture between the Departments of Geography, Geology and Atmospheric and Ocean Science on Campus, and the Earth Sciences Directorate at NASA Goddard. This wealth of in-house and collaborative resources positions our graduate students with an unmatched spectrum of opportunities and gives them access to a strong multi-disciplinary program of international stature.

Our current student demographics are diverse, with an approximate 50:50 mix of male and female students of which 10-20% are minority students. Approximately 60% of our graduate students are Ph.D. candidates (the remaining are M.S. students), and some of the M.S. students will petition to become Ph.D. candidates following the successful completion of their M.S. degree program. Other M.S. candidates are focused solely

on the M.S. degree, which is the commonly held degree for practicing professionals in government and industry.

Our graduate students benefit from the opportunities of working within an advanced graduate program. Our graduates go on to distinguished post-doc, research and applied positions in academic, government and industrial settings. We proudly acknowledge having placed our students into prestigious post-doc positions and government laboratories and we highlight their publications (see <https://www.geol.umd.edu/graduate/gradpubs.php>), presentations at national and international meetings (see <https://www.geol.umd.edu/graduate/gradpresentations.php>) and awards (see <https://www.geol.umd.edu/graduate/gradfunding.php>).

## Financial Assistance

Graduate students are eligible for Departmental teaching assistantships, Graduate School fellowships and grant-supported fellowships and research assistantships. In addition, some curatorial, library and other part-time work is sometimes available.

## Contact

See the Department of Geology Web page at URL <https://www.geol.umd.edu> (<http://www.geol.umd.edu>) for additional information. The Department's Graduate Studies in Geological Sciences also provides additional information on the requirements, examinations, faculty research interests and publications, research facilities and financial aid. Copies are available from:

### Graduate Coordinator

1118 Geology Building  
8000 Regents Drive  
University of Maryland  
College Park, MD 20742  
**Telephone:** 301.405.4065  
**Email:** [grad-sec@umd.edu](mailto:grad-sec@umd.edu)

**Website:** <https://www.geol.umd.edu> (<http://www.geol.umd.edu>)

**Courses:** GEOL (<https://umd-curr.courseleaf.com/graduate/courses/geol/>)

## Admissions

### General Requirements

- Statement of Purpose
- Transcript(s)
- TOEFL/IELTS/PTE (international graduate students (<https://gradschool.umd.edu/admissions/english-language-proficiency-requirements/>))

### Program-Specific Requirements

- Letters of Recommendation (3)
- Graduate Record Examination (GRE)
- Personal Statement

Qualified students with a B.S. degree in geology, physics, mathematics, chemistry, biology, engineering or other related sciences are invited to apply for admission to the graduate programs. Our graduate degree program in geophysics welcomes students with undergraduate degrees in physics and or astronomy having little to no background in geology. Coursework expectations for students applying to the program is at least

a year of calculus, a semester of physics for science majors, and for those in the in geology and geochemistry track a year of chemistry or its equivalent. All students must submit the Graduate Record Examination scores to be considered for admission.

For more admissions information or to apply to the program, please visit our Graduate School website: [www.gradschool.umd.edu/admissions](http://www.gradschool.umd.edu/admissions) (<https://gradschool.umd.edu/admissions/>)

Further information is found at the following URL <https://www.geol.umd.edu/graduate/index.php> (<https://www.geol.umd.edu/graduate/>)

## Application Deadlines

Type of Applicant	Fall Deadline	Spring Deadline
<b>Domestic Applicants</b>		
US Citizens and Permanent Residents	5 Jan	11 Dec
<b>International Applicants</b>		
F (student) or J (exchange visitor) visas; A, E, G, H, I and L visas and immigrants	5 Jan	25 Sept

**Other Deadlines:** Please visit the program website at <http://www.geol.umd.edu>

## Requirements

- Geology, Doctor of Philosophy (Ph.D.) (<https://academiccatalog.umd.edu/graduate/programs/geology-geol/geology-phd/>)
- Geology, Master of Science (M.S.) (<https://academiccatalog.umd.edu/graduate/programs/geology-geol/geology-ms/>)

## Facilities and Special Resources

The Department maintains a suite of state-of-the-art facilities and equipment for research, including: three solid source mass spectrometers, six gas source mass spectrometers, with inlet devices for inorganic and organic isotope analyses, single and multicollector inductively-coupled plasma mass spectrometers (ICP-MS), three UV lasers for in situ analyses with gas-source and plasma mass spectrometer, two chemical clean labs, with ion chromatographic facilities, JEOL 8900 superprobe with an Oxford instrument minicathodoluminescence detector, Scanning and Transmission Electron Microscopes, color image analysis system, fluid inclusion stage, high temperature and high pressure equipment for dry or hydrothermal experiments, diamond anvil cell facilities, including laser heating and external heating, two triaxial deformation apparatus with flow through capacity and acoustic emission recording, flame and graphite furnace atomic absorption equipment, spectrophotometers, HPLC with fluorescence detector, UV lamps and monochromator for photochemistry, anoxic chamber, Geographic Information Systems (GIS) computational laboratory, electromagnetic and acoustic doppler velocity meters, laboratory and field hydrogeology equipment, campus drill rig, microstructures and fabrics analysis instruments, research microscopes with reflectance capabilities, rock preparation and mineral separation laboratories, computer network with direct access to supercomputer facilities, nitrogen Permeameter 400, helium Porosimeter 300, Solaris Impedance Meters.