

THE FIELD

The primary objectives of geology are to understand the rates and processes that constantly change the Earth and other terrestrial planets, as well as to decipher the history of the Earth and terrestrial planets from the time of origin of the solar system to the present day. Achieving those objectives involves diverse activities. Geologists study active natural features such as coastlines, glaciers, lakes and rivers, and volcanoes. They map rocks, sediments, and other features to learn of past events and conditions and conduct field and laboratory studies to determine fundamental chemical and physical properties of minerals, rocks, sediments, and surface and ground waters. Finding and developing deposits of industrial minerals and rocks, metallic ores, gas and oil, and groundwater aquifers, as well as managing geologic hazards and toxic waste, all require insight into geological relationships and processes. One major focus of the geosciences and of the department is the study of global environmental change and climate change history from the perspectives of both terrestrial and marine environments.

A minor in geology is available.

Geology students may pursue secondary education certification in conjunction with the major. See the education major sheet or the Guide to Undergraduate Programs (umass.edu/education, umass.edu/ug_programguide) for more information.

THE MAJOR

The bachelor of arts (BA) degree program is intended to provide a firm background in geology while allowing sufficient flexibility to pursue other areas as well. This degree is suitable for pre-law and pre-dental/pre-medical students. Requirements include 15 credits of supporting science and mathematics: GEOL 101 (or any other introductory geology course, plus GEOL 131), GEOL 201, and 21 credits of upper-division geology or physical geography courses (GEOL 231 or courses numbered 300 and above) with a minimum of 15 credits in geology. Upper-division courses should be selected in consultation with a geology advisor.

Two separate bachelor of science (BS) tracks are available: geology and Earth science. The geology track provides a strong background for students wishing professional careers in geology. Requirements include two semesters of general chemistry, calculus, and physics, all chosen in consultation with an advisor. GEOL 101 (or any other introductory geology course, plus GEOL 131), and GEOL 201, 231, 311, 321, 331, 431, and 445 make up the core of this option. An additional 12 credits in upper-division geology or physical geography courses numbered 300 or above are also required. All electives should be selected in consultation with a geology advisor. Majors should also enhance their employability by acquiring practical field experience before they graduate.

The Earth science track is recommended to students interested in teaching at the secondary-school level or in pursuing graduate studies in education. The program requires completion of courses comprising four blocks. The basic Earth science block requires 13 credits. The supporting sciences block (23–24 credits) requires at least one course in biology, at least one course in calculus, two semesters of general chemistry, and two semesters of physics. The required courses in the geology block (15 credits) are GEOL 201, 231, 311, and 321. An electives block (9 credits) consists of upper-division courses in geology or physical geography. Students are encouraged to take an environmental geology or related course as part of the electives block.

TEACHER CERTIFICATION

Undergraduate students must achieve a passing score on the Communication and Literacy Skills test of the Massachusetts Educator Certification Tests (MECT) prior to admission into professional preparation programs for educators. For further information about the procedures leading to teacher certification in Massachusetts, students should follow the guidelines in the Secondary Teacher Education Program (STEP) available at the School of Education.

HONORS

Contact the departmental honors coordinator for information on how to pursue honors opportunities within the major.

STUDY ABROAD

Majors may choose to study abroad if it supports their academic and career goals. Students should contact the International Programs Office (413-545-2710, umass.edu/ipo) and work closely with their academic advisor to choose the appropriate courses in preparation.

CAREER OPPORTUNITIES

A wide variety of employment opportunities are open to geologists. Most are employed in private industry by firms involved in environmental and engineering geology and hydrogeology, and in exploration for oil and mineral resources. A growing number of geology graduates obtain employment with federal or state geological surveys, or with agencies involved with the environment, sustainability, or with energy. Although government agencies and industrial firms hire some geologists with BS or BA degrees, many employers generally prefer geologists who have obtained the master's degree. Currently, a few colleges and secondary schools also hire geologists.

COLLEGE OF NATURAL SCIENCES

The College of Natural Sciences unites the life, environmental, computational, and physical sciences on campus. Students take advantage of a range of inquiry-based classroom and laboratory experiences, hands-on undergraduate research opportunities, multidisciplinary and cross-departmental education and research initiatives, and a variety of science student organizations. In addition, they are encouraged to develop strong written and oral communication skills, as well as leadership and problem-solving abilities.

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