

Engineering Geology

The
University
of Akron

ENGINEERING GEOLOGY

Geology is the science of the solid matter of the Earth, which includes analyses of its composition, structure, physical properties, history and all the processes that shape it.

An understanding of geology has helped us discover, describe, locate and manage the Earth's natural resources such as coal and petroleum; metals such as iron and copper; minerals such as asbestos and mica; gemstones such as diamonds and sapphires; and elements such as helium and sulfur.

Geology is of enormous importance to the development, stability and future of our world and the natural environment.

As a subdivision of the field, engineering geology applies geology to engineering practice. Expertise in engineering geology ensures that geologic factors affecting location, design, construction, operation and maintenance of engineering projects are recognized and accommodated.

Engineering geologists apply geological principles, facts and techniques to civil and environmental engineering projects. They analyze geologic factors that might affect the construction of bridges, buildings, airports or dams, for example. They might also work on natural hazard reduction projects, using their skills to detect, prevent and control such environmental problems as soil erosion, water pollution, landslides and flooding.

DEGREE PROGRAMS AT UA

The University of Akron offers the following undergraduate degrees in geology: a B.S. and a B.A. in geology with an emphasis in environmental science or in earth science; a B.S. in engineering geology; and a B.S. in geophysics.

As an undergraduate student, you will take courses in physical, historical and structural geology; petrography, paleontology and mineralogy. Depending on your major field of interest, you are encouraged to take additional courses, especially in supporting sciences, mathematics and engineering fields.

The Department of Geology uses modern instrumentation for field and laboratory studies. You will have access to an environ-

FOR MORE INFORMATION, VISIT THESE WEB SITES:

Department of Geology: <http://www.uakron.edu/colleges/artsci/depts/geology/>

Buchtel College of Arts and Sciences: <http://www.uakron.edu/colleges/artsci/>

The University of Akron: <http://www.uakron.edu>

Office of Admissions: <http://www.uakron.edu/admissions/>

Honors College: <http://www3.uakron.edu/honors/>

Center for Career Management: <http://www.uakron.edu/ccm/>

U.S. Bureau of Labor Statistics: <http://www.bls.gov/>

U.S. Bureau of Labor Statistics Occupational

Outlook Handbook: <http://www.bls.gov/oco>

mental scanning electron microscope, an automated electron microprobe, an automated X-ray diffraction system, an ion-coupled plasma spectrometer, an atomic absorption spectrometer, an ion chromatograph, and coal and sulfur analyzers.

Additional equipment includes an oxygen bomb calorimeter, a gravimeter, resistivity gear, refraction seismography, magnetometers, ground-penetrating radar, image analyzer and a cathodoluminescope.

The microcomputer laboratory has computers compatible with Geographic Information Systems (GIS), a wide carriage network plotter, a flat bed and slide scanner. Other features are a core laboratory, research microscopes, a well-equipped darkroom, rock saws, automated thin-section equipment, portable rock corer and a Giddings soil probe.

The department recently acquired instrumentation for measuring environmental magnetism of Quaternary sediments and is pursuing funding for additional equipment to further augment this research. It is also developing a new area of leadership in earth science education and research.

A particular strength of the department is Terrestrial Records of Environmental Change (TREC). This research covers such diverse but related topics as hydrogeology; paleoclimate reconstruction; climate change; glacial geology; modern siliciclastic and carbonate sedimentology; geomorphology; and aqueous geochemistry.

Our distinguished faculty are innovative and actively involved in a wide range of traditional and cutting-edge research interests — from environmental and engineering

geology to structural geology, economic geology, geophysics, petrology, stratigraphy and paleontology.

CAREER OPPORTUNITIES

Career opportunities abound and will continue to grow for those with degrees in geology. Their knowledge, skills and experience are needed here and abroad, especially as governments and industries establish policies to safeguard the environment.

According to National Science Board Science and Engineering Indicators, 2006, about 150,000 geoscientists work in the United States, employed by industries related to oil and gas, mining and water resources, or by private and government agencies specializing in environmental studies. Some geoscientists work as independent consultants, providing expertise to solve such problems as water pollution and soil erosion.

Those with advanced degrees increase their ability to succeed in the marketplace of jobs; many work in university settings, teaching and doing research. In addition, as advanced technologies spur job creation and growth, backgrounds in related scientific and technological fields continue to complement degrees in engineering geology. Graduates with work experience through academic laboratories, internships, fellowships or co-ops also stand out among job seekers.

AKRON ADVANTAGE

Your education extends beyond the classroom to locations across the country. Faculty members and students regularly travel throughout the United States in their scientific investigations.

Summer field camp is conducted in South Dakota, Wyoming and Colorado each year. Field trips also are taken during the school year to such places as Canada, the Bahamas, Kentucky, Colorado, Virginia and Missouri.

Classroom instruction is enhanced through student activities. As a geology major, you might be interested in the Geology Club, which organizes outings and meetings that complement classroom instruction.

The college offers job-related services through its A&S Careers Program, which creates links between students, alumni and local professionals. As a Buchtel College of Arts and Sciences student, you have access to its lending library with up-to-date, career-related publications; a computer workroom for resume writing and employment research; volunteer, paid and for-credit internship placement on and off campus; and department-specific mentoring arrangements.

HIGH SCHOOL PREPARATION

High school students considering the engineering geology program at The University of Akron are encouraged to follow the college prep curriculum while in high school. This includes four years of English, three years each of math, natural science and social science, and two years of foreign languages. Clear, concise writing skills are also imperative. If you have not completed the recommended courses, you may be required to take University courses to meet the basic criteria.

THE UNIVERSITY OF AKRON

You may already know that The University of Akron is the public research university for Northern Ohio. But we're much more than labs and lasers.

Our 24,700 students choose from approximately 300 academic programs and areas of study, from accounting to zoology. Many of our undergraduate programs have gained national recognition, including psychology, sales and marketing, dance, global business and gerontological nursing.

About 7,000 students live in our 12 residence halls or just a short walk from campus. When they aren't hitting the books, thousands take advantage of the University's fraternities, sororities and more than 200 student organizations, from gospel choir and alpine skiing to career-building professional and academic societies. We also offer 17 intramural sports and clubs, from bowling to cardio kickboxing.

The University's ongoing, major campus renovation campaign that began in 2000, the "New Landscape for Learning," has added 11 new structures, including two classroom buildings, as well as 30 acres of green space and numerous additions. This transformation continues today — UA's first on-campus football stadium is scheduled to be completed in time for the Zips' 2009 home opener.

Here's more of what you'll find at the new UA:

- Student Recreation and Wellness Center, a massive structure with ball courts, fitness facilities, rock climbing wall and a recreational pool that includes a 30-seat spa, "lazy river" and fountain.
- Student Union, containing a movie theatre, billiards/bowling room, food court, Starbucks, bookstore and headquarters for student organizations.
- Honors Complex with combination residence hall and academic facilities.
- Gardens, lawns, amphitheatre and tree-lined pathways.

You'll also discover a campus retooled for your academic success. We are Ohio's most wired-for-wireless public university, and can provide you reduced-rate, high-speed Internet access off campus.

ADMISSION INFORMATION

The Office of Admissions
330-972-7100 or 800-655-4884
<mailto:admissions@uakron.edu>
<http://www.uakron.edu/admissions/>

Sample Curriculum

Bachelor of Science Degree in Engineering Geology

First year:		Third Year:	
English Composition I, II	7	Foreign Language 201, 202	6
Public Speaking		Humanities	3
or		Humanities in Western Tradition I	4
Oral Communications	3	Engineering Geology	3
Intro Physical Geology	4	Sedimentation/Stratigraphy	3
Intro Historical Geology	4	Structural Geology	3
Chemistry I, II	6	Statics	3
Chemistry Lab	1	Intro to Mechanics of Solids	3
Calculus I, II	8	Dynamics	3
Total hours	33	Total hours	31
Second year:		Fourth year:	
Physical Education/Wellness	1	Humanities	3
Foreign Language 101, 102	8	Area Studies/Cultural Diversity	4
Crystallography/Non-Silicate Mineralogy	4	Exploration Geophysics OR Soil & Rock	
Silicate Mineralogy/Petrology	4	Exploration	3
Calculus III	4	Geology Field Camp I, II	6
Intro Differential Equations	3	Soil Mechanics	3
Physics I, II	8	Geotechnical Engineering	3
Total hours	32	Fluid Mechanics	3
		Geology electives (300/400 level)	3
		Elective courses (adviser approved)	4
		Total hours	32