Geology

“Civilization exits by geological content, subject to change without notice.” – Will Durant

About the Program

Geology is the science of Earth: how it evolved, the materials it consists of, and processes taking place. Earth is a complex system involving physical, chemical, and biological processes. So, geological studies often overlap with these other, fundamental sciences, and our program takes advantage of expertise provided by other UND science departments.

The School of Geology and Geological Engineering offers several undergraduate degrees, each having a different focus. Our programs provide exciting opportunities for our majors, and also opportunities for non-majors seeking to gain a greater understanding of Earth, planetary environments, and resources. All of our curricula involve study of Earth materials, so key components of our courses include hands-on laboratory activities and field trips to exciting geological occurrences.

Geology involves many subdisciplines. Geological studies may be in historical geology, geomorphology (glaciers, erosion, and other processes that shape Earth’s surface), sedimentology (how sediments and sedimentary rocks form), stratigraphy (the nature of rock formations of different ages), paleontology (fossils, and past and current life forms), mineralogy (minerals), petrology (rocks of all sorts), geophysics (heat flow, earthquakes, gravity, deformation of Earth materials), volcanology (volcanoes and volcanic disasters), geochemistry (the chemistry of natural materials of all sorts), hydrology (surface water and groundwater), engineering geology (applications to ongoing real-world challenges), and environmental geology (resources, pollution, and other related topics).

The total number of students enrolled in our geology programs typically ranges from 20 to 50. Large introductory classes may contain as many as 100 students, but class sizes for courses taken by our majors are typically between 5 and 20 students. Field trips, including our very popular spring break field trip to warm places in and outside of the United States, usually involve 15-25 students.

Major & Minor Options

Our department is part of the School of Engineering and Mines (which offers our Geological Engineering degree), but our Bachelor of Science (B.S) and Bachelor of Arts (B.A.) degrees in Geology are awarded through the College of Arts and Sciences. Both degrees provide excellent preparation for graduate school or entry-level employment. The B.S. program combines a comprehensive education in geology with a strong background in related sciences and mathematics. This degree combines well with a minor in space studies, geography, chemistry or physics.

The B.A. in Geology provides a liberal arts emphasis in a flexible geology program. Double majors are possible, involving disciplines in the arts, humanities, and social sciences as well as aviation, business, communication, education, and pre-law. In addition to four-year degrees, the program also offers a minor in geology and a teaching certification in geology.

Curriculum

All students are assigned academic advisors to assist them as they prepare a plan of study to meet UND’s degree requirements. Most of our majors begin by taking Introduction to Geology (Geo 101) and The Earth Through Time (Geo 102) before moving on to Mineralogy (Geo 318), Petrology (Geo 320), Structural Geology (Geo 330), Sedimentology and Stratigraphy (Geo 411), and other upper level courses. They also are engaged in geological research projects and get experience preparing and giving professional presentations.

The culminating class in our curriculum is our capstone class: The Evolving Earth (Geo 420). Department faculty also offer two or three field trips each year which have included travel to Hawaii to study volcanoes, to fossil locations in the Northern Plains, and to the California coast and National Parks of the southwest United States.

Internship/Practical Experience

The Geology program provides hands-on opportunities for students to help solve environmental problems for state and federal agencies, industry, and environmental firms. Some of our students also obtain summer employment with environmental firms or with coal or oil companies. While gaining practical experience, our students have traveled with faculty to field sites in Peru, India, England, Belgium, Canada, and locations throughout the United States.
**Student Organizations**
The Department sponsors two student organizations: The Association of UND Geologists, and Sigma Gamma Epsilon. Students typically join other UND student organizations as well.

**Research**
The department has a variety of sophisticated equipment for teaching and research in the field and in the laboratory. Cutting-edge research in the department includes studies of global climate change, CO2 sequestration, enhanced geothermal resources, wetlands hydrology, Cretaceous-Paleogene boundary paleontology, evolution of the early Earth, the composition of Earth’s mantle, surface processes in Antarctica and elsewhere, and aquifer chemistry.

International research in the department includes: volcanoes in the Andes; global climate change with field studies and collaborators in Brazil, Canada, Czech Republic, Germany, Jordan, Poland, and the United States; meteor impact craters in Manitoba and Maryland; paleontology in India, Madagascar, Africa, South America, and North America; and geomorphology in the western United States and Antarctica.

**Facilities**
Leonard Hall (the home of all geology faculty and students) was designed specifically for the Geology department and contains ample laboratory, office, and classroom space. The F.D. Holland Jr. Geology Library is one of the largest in the upper Midwest and has a complete collection of U.S. Geological Survey maps and publications. The library is also a depository for many other U.S. Government documents.

The North Dakota Geological Survey’s Wilson M. Laird Core and Sample Library is directly across the street from Leonard Hall and houses approximately 85 miles (137 km) of cores and approximately 40,000 boxes of drill cuttings of the Williston Basin, as well as an extensive collection of water well samples and cores.

**Career Opportunities**
Geology graduates are employed in a broad spectrum of careers that include the oil and gas industry, environmental and engineering geology companies, the federal government, state geological surveys, the mining and mineral industries, Department of Energy national laboratories, and universities and colleges. The long-range salary outlook in geology is good. Dwindling energy, mineral, and water resources, along with increasing concerns about the environment and natural hazards, present new challenges to society that need to be met by geoscientists.

Typical salaries for college graduates with bachelor’s degrees range from about $40,000 to $80,000. Starting salaries for geoscientists with graduate degrees (MS or PhD) range from $60,000 to $100,000. At present, careers in environmental geology tend to start at the low end of these ranges, while careers in the oil industry are at the top.

**Alumni**
Geology alumni strongly support departmental programs. Because they retain an interest in the Department and the University, they have been very loyal and generous with both their funds and their time. Currently, 19 alumni donate their time to serve on our Alumni Advisory Committee. Prominent alumni include presidents of oil companies, state geological survey directors, corporate CEO’s, and scientists and engineers.

**Faculty**
All faculty members are committed to helping students do their best and succeed, with a strong focus in hands-on learning. Interaction with faculty occurs formally in the classroom, on field trips, and through the advising process, but also informally because faculty maintain an open door policy so students can stop by with any questions or to get advice. It all adds up to an environment that fosters mutual respect and maximizes learning.

**Admissions**
Students pursuing a degree in Geology will be admitted to the College of Arts and Sciences, and will declare Geology as their major. The major has no additional admittance requirements beyond the University’s requirements.

**Scholarships/Financial Assistance**
The Department has considerable scholarship resources, including funds to support student research, travel, and participation in summer field camp. For more information visit: [http://engineering.und.edu/geology-and-geological-engineering/scholarships.cfm](http://engineering.und.edu/geology-and-geological-engineering/scholarships.cfm)

**For more information:**

UND Department of Geology and Geological Engineering
Leonard Hall Room 101
81 Cornell Street Stop 8358
Grand Forks ND 58202-8358
701.777.2811
1.800.CALL.UND, ext. 2811
geology.und.edu

Website: go.UND.edu/academics

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