Geology

Undergraduate Study

The department offers courses in geology and meteorology. Majors can be earned in earth science (B.A., B.S.), geology (B.S.), and meteorology (B.S.). Candidates for all degrees must satisfy the requirements established by the College of Liberal Arts and Sciences (see Liberal Arts and Sciences, Curriculum). In addition, the department has requirements for each major. A minimum of 120 credits are required.

The bachelor of science in Geology prepares the student for a professional career and/or graduate study in the geological sciences. Students selecting geology as a major will elect an option in traditional geology or environmental geology/hydrogeology. The traditional option prepares a student for employment in state and U.S. geological surveys, mineral and petroleum exploration, and graduate study in most aspects of geology. Required courses in this option include:

GEOL 100	The Earth	3
GEOL 100L	The Earth: Laboratory	1
GEOL 102	History of the Earth	3
GEOL 102L	History of the Earth: Laboratory	1
GEOL 302	Summer Field Studies	6
GEOL 315	Mineralogy and Earth Materials	3
GEOL 315L	Laboratory in Mineralogy and Earth Materials	1
GEOL 316	Optical Mineralogy	2
GEOL 356	Structural Geology	5
GEOL 365	Igneous and Metamorphic Petrology	3
GEOL 368	Sedimentary Geology	4
GEOL 479	Surficial Processes	3
And 9 credits of geology electives		9
Total Credits		**44**

The environmental geology/hydrogeology option prepares a student for employment in environmental consulting, state and U.S. geological surveys, regulatory agencies, and graduate study in the environmental aspects of geology. Required courses in this option include:

GEOL 100	The Earth	3
GEOL 100L	The Earth: Laboratory	1
GEOL 102	History of the Earth	3
GEOL 102L	History of the Earth: Laboratory	1
GEOL 302	Summer Field Studies	6
GEOL 315	Mineralogy and Earth Materials	3
GEOL 315L	Laboratory in Mineralogy and Earth Materials	1
GEOL 316	Optical Mineralogy	2
GEOL 356	Structural Geology	5
GEOL 368	Sedimentary Geology	4
GEOL 411	Hydrogeology	4
One of the following		3
GEOL 419	Environmental Geochemistry	
GEOL 426	Stable Isotopes in the Environment	
GEOL 434	Contaminant Hydrogeology	
GEOL 479	Surficial Processes	3
And 6 credits of geology electives		6
Total Credits		**45**

Required supporting courses include:

CHEM 177	General Chemistry I	4
CHEM 177L	Laboratory in General Chemistry I	1
CHEM 178	General Chemistry II	3
CHEM 178L	Laboratory in College Chemistry II	1
PHYS 111	General Physics	5
PHYS 112	General Physics	5
One of the following		4
MATH 165	Calculus I	
MATH 181	Calculus and Mathematical Modeling for the Life Sciences I	
One of the following		4
MATH 166	Calculus II	
MATH 182	Calculus and Mathematical Modeling for the Life Sciences II	
And 6 additional credits from an approved departmental list of courses in the science, engineering, or mathematical disciplines outside of geology		6
Total Credits		**33**

No more than 9 credits in 490 may be counted toward a degree in Geology.

See Four-Year Graduation Plan: B.S. in Geology - Traditional Option

See Four-Year Graduation Plan: B.S. in Geology - Environmental-Geology/Hydrogeology Option

Communication Proficiency requirement: The department requires a grade of C or better in:

ENGL 150	Critical Thinking and Communication	3
ENGL 250	Written, Oral, Visual, and Electronic Composition	3
or ENGL 250H	Written, Oral, Visual, and Electronic Composition: Honors	
One of the following:		3
ENGL 309	Report and Proposal Writing	
ENGL 314	Technical Communication	
ENGL 302	Business Communication	
JL MC 347	Science Communication	
Total Credits		**9**

Minor - Geology

A minor in Geology may be earned by taking 15 credits of geology coursework, including:

3 credits:		
GEOL 100 & 100L	The Earth and The Earth: Laboratory	3-4
or GEOL 201	Geology for Engineers and Environmental Scientists	
GEOL 102	History of the Earth	3
GEOL 102L	History of the Earth: Laboratory	1

The remainder should be at the 300 level or above.

Graduate Study

The department offers programs leading to the master of science and doctor of philosophy with majors in Earth Science, Geology, and Meteorology. Program options are available for the M.S. and Ph.D. degrees in earth science leading to careers in teaching. The department also cooperates in the interdepartmental major in Water Resources (see Index). Students desiring a major in the above fields normally will have a strong undergraduate background in the physical and mathematical sciences. Individuals desiring to enter a graduate program are evaluated by considering their undergraduate background and performance and their expressed goals.

Programs of study are designed on an individual basis in accordance with requirements of the Graduate College and established requirements for each departmental major. Additional coursework is normally taken in aerospace engineering, agronomy (soil science), chemistry, civil and construction engineering, computer engineering, computer science, engineering mechanics, materials engineering, mathematics, mechanical engineering, microbiology, physics, or statistics. Departmental requirements provide a strong, broad background in the major and allow considerable flexibility in the program of each individual.

A dissertation is required of all Ph.D. candidates.

M.S. students in Geology are required to complete a thesis. The M.S. in Earth Science is available to students electing the non-thesis (Creative Component) option in Geology or Meteorology. A non-thesis option is also offered for the M.S. degree in Meteorology.

Graduates in Geology specialize in a subdiscipline, but they comprehend and can communicate the basic principles of geology and supporting sciences. They possess the capacity for critical and independent thinking. They are able to write a fundable research proposal, evaluate current relevant literature, carry out the proposed research, and communicate the results of their research to peers at national meetings and to the general public. They work as consultants on engineering and environmental problems, explorers for new minerals and

hydrocarbon resources, researchers, teachers, writers, editors, and museum curators.

Course requirements for the MS degree include MTEOR 542, 543, 507 or 518, 552 or 516x, and 502 or 504 or 505 or 605. In addition to the 5 required courses from this list, students must take at least 3 more credits of graduate course work in Meteorology, Agricultural Meteorology, or a field related to their research interests (students will work closely with their POS committee to determine the exact amount of structured course work required – typically this is 18-21 credits). Students without prior synoptic meteorology course work must complete MTEOR 511 and may substitute these credits in place ofthe required MTEOR 507 or 518 courses.

Graduates in Meteorology have a good comprehension of basic principles, a capacity for critical and independent thought and an ability to communicate effectively with scientific colleagues. They have an appropriate breadth in their understanding of meteorology with a suitable specialization. Graduates are able to undertake thorough research and explain the results in a scientifically reasonable fashion.