College of Arts & Sciences

Geology

Overview

Geology is often defined as the study of the physical aspects of the Earth, particularly its composition and structure. But it's much more than that. Understanding the processes that have shaped our dynamic planet, both past and present, involves chemistry, physics, mathematics and biology, along with history, logic and art. Professional geologists also utilize creativity, ingenuity and 3-D visualization, as well as speaking and writing skills. A geology career can utilize all your talents and apply them to areas of great importance to society, such as mineral and hydrocarbon exploration, safeguarding water resources, mitigation of natural hazards, remediation of environmental problems, and providing insights into past climate change.

Professional options

Careers

At no point in the past 60 years has there been such a sustainable demand for geologists, and geoscience-related occupations are expected to grow much faster than the average growth of all U.S. occupations. This involves three distinct employer groups: the energy and natural resources sector (mostly petroleum and mining), the environment sector (mostly groundwater and hazards) and the government sector (research and regulatory agencies). The demand for new geologists exceeds the number of geology graduates available.

The demand for geologists is reflected in salary offers. The petroleum industry is leading the way, with annual salaries often exceeding $100,000. The mean annual wage for all geoscientists is approximately $82,500. Job opportunities, salaries and opportunities for advancement are significantly enhanced with a Master of Science degree. Completing a master's degree immediately after a bachelor's degree typically takes 24 months.

Points of pride

The Princeton Review picked K-State among the best colleges in the country. K-State is a national leader among state-supported universities in its total of Rhodes, Marshall, Truman, Goldwater and Udall scholarship winners.

Academics

Degree options

Geology majors may earn either a Bachelor of Science or a Bachelor of Arts degree, with the difference being a foreign language requirement for the Bachelor of Arts.

In addition to the College of Arts & Sciences requirements, the major requires 8 credit hours of chemistry (CHM 210 and 230), 8 credit hours of physics (PHYS 113 and 114, or PHYS 213 and 214), 8 credit hours of calculus (MATH 220 and MATH 221) and 41 credit hours of geology. Students entering the geology major as freshmen can readily complete the degree requirements in four years, with part of one summer used for a field geology course.

The Department of Geology offers a dual degree with the Department of Civil Engineering. We also cooperate with the College of Education to offer an earth science option for high school teachers. Finally, the geology department offers minors in both geology (18-20 hours) and exploration and environmental geophysics (16 hours). See the course catalog at catalog.k-state.edu for details.

Faculty

The department has 11 full-time faculty members and four part-time instructors. We maintain active research programs in a wide range of geoscience subdisciplines, including chemical hydrogeology, petroleum geology, exploration seismic and near surface geophysics, structural geology, economic geology, igneous petrology, volcanology, isotope geochemistry, climate change, tidal sedimentation processes, luminescence dating, biomineralization and biogeochemistry.

Research

Research opportunities exist for upper-level undergraduates as well as graduate students. In fact, participation of undergraduates in their research is actively encouraged by department faculty. This can involve the writing of a senior thesis and/or presenting research results at appropriate conferences.

Preparation

The standard four-year curriculum permits either breadth or specialization in the last three semesters. With room for a number of electives, you can develop skills in geophysics, hydrogeology, geochemistry, petroleum geology or other exciting fields, such as biogeochemistry or medical geology.

Transferring

Every year, some students enter the geology major as transfers. In general, students who have 60 transferable hours, including English, speech, math, physics and chemistry requirements; have had GEOL 100 and GEOL 103; and who are entering the program in the fall semester should be able to complete their degrees within two years and a summer. Other transfer students should plan on three years to complete their degrees. Our advisors will help prepare detailed schedules.

Activities

Clubs

As a small department, we know one another. Together with our student clubs — the Williston Geology Club, Kansas State University AAPG student chapter and the Sigma Gamma Epsilon honor society — we organize field trips and community service events, arrange trips to career expos and short courses, share picnics and pizza lunches, and host outside speakers.

Financial assistance

Scholarships

The alumni of the geology department have shown their support and generosity by endowing more than 20 scholarships, including several that can be awarded to incoming freshmen. In recent years, the total scholarship funding for geology majors and graduate students has averaged nearly $50,000, with individual awards ranging from $500 to $4,000.

Suggested course work

120 hours

Freshman year

First semester

Hrs.	Course	
3	GEOL 100	Earth in Action
1	GEOL 103	Geology Lab
3	ENG 100	Expository Writing 1
4	CHM 210	Chemistry I
3	Humanities or social science elective (one course)	
14		

Second Semester

Hrs.	Course	
3	GEOL 102	Earth through Time
4	CHM 230	Chemistry II
3	ENG 200	Expository Writing II
3	COMM 106	Public Speaking I
2	Humanities (Fine Arts, one course)	
15		

Sophomore year

First Semester

Hrs.	Course	
3	GEOL 502	Mineralogy
4	MATH 220	Analytical Geometry and Calculus
6	Humanities or social science electives (two courses)	
13		

Second semester

Hrs.	Course	
3	GEOL 503	Petrology
4	MATH 221	Calculus II
6	Humanities or social science electives (two courses)	
13		

Junior year

First Semester

Hrs.	Course	
3	GEOL 560	Field Methods*
3	GEOL 581	Invertebrate Fossils§
	or	
	GEOL 650	Geomicrobiology§
3	GEOL 530	Structural Geology
4	PHYS 113	General Physics I
	or	
	Phys 213	Engineering Physics
3	Elective (one course) - could be international overlay	
15		

Second Semester

Hrs.	Course	
3	GEOL 630	Stratigraphy - Sedimentology
3	Geology Elective from Groups I - II - III	
4	PHYS 114	General Physics II
	or	
	PHYS 214	Engineering Physics II
6	Humanities or social science electives (two courses)	
16		

Summer Semester

Hrs.	Course	
3	GEOL 680	Field Camp

Senior year

First Semester

Hrs.	Course	
6	Geology elective from Groups I - II - III	
9	Electives (three courses)	
15		

Second Semester

Hrs.	Course	
3	Geology elective Groups I - II - II	
12	Electives (four courses)	
15		

* GEOL 560 not mandatory if taking 6 CH field camp
§ not required but satisfies CAS Life Sciences requirement

Select at least one each from Groups I, II and III below and one additional elective from Groups I, II, III or IV

Group I

3	GEOL 605	Introduction to Geochemistry
3	GEOL 640	Introduction to Geophysics

Group II (Energy and natural resources)

3	GEOL 702	Economic Geology
3	GEOL 730	Petroleum Geology
3	GEOL 742	Seismic Data Interpretation

Group III (Surficial processes and the environment)

3	GEOL 520	Geomorphology
3	GEOL 611	Hydrogeology
3	GEOL 650	Geomicrobiology

Group IV (Other electives)
Any remaining Geology course 500-level or above.

Geology minor

Hrs.	Course	
3	GEOL 100	Earth in Action
1	GEOL 103	Geology Laboratory
3	GEOL 502	Mineralogy
9	At least three additional courses at 500 level or above (excluding GEOL 512)	
16		

Exploration and environmental geophysics minor

Hrs.	Course	
3	GEOL 100	Earth in Action
1	GEOL 103	Geology Laboratory
3	GEOL 640	Introduction to Geophysics
3	GEOL 642	Field Geophysics
3	GEOL 742	Seismic Interpretation
3	GEOL 520	Geomorphology
	or	
	GEOL 630	Stratigraphy - Sedimentation
16		

Distribution requirements
The College of Arts and Sciences requires each student to take 11 credit hours (four courses) in the humanities and 12 credit hours (four courses) in the social sciences. See the undergraduate catalog at catalog.k-state.edu for details.

For more information about geology, contact:

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