

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, 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 eight credit hours of chemistry (CHM 210 and 230), eight credit hours of physics (PHYS 113 and 114, or PHYS 213 and 214), eight credit hours of calculus (MATH 220 and MATH 221) and 40 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 full- or 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, the Society of Exploration Geophysicists 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 \$100,000, with individual awards ranging from \$500 to \$4,000.

Suggested coursework

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 Principles of Paleontology
3	GEOL 530 Structural Geology
4	PHYS 113 General Physics I
or	
3	Phys 213 Engineering Physics
3	Elective (one course) - could be international overlay
15	

Second Semester

Hrs.	Course
3	GEOL 630 Sedimentology – Stratigraphy
3	Geology Elective from Groups I - II - III
4	PHYS 114 General Physics II
or	
6	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 - III
12	Electives (four courses)
15	

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, including but not limited to:

Hrs. Course

3	GEOL 510 Geology of Planets
3	GEOL 540 Geologic Record of Climate Change
3	GEOL 599 Senior Thesis
3	GEOL 711 Water Resources Geochemistry
3	GEOL 735 Fossil Fuel Sedimentology
3	GEOL 738 Formation Evaluation
3	GEOL 740 Regional Geology
3	GEOL 741 Seismic Data Processing
3	GEOL 747 Numerical Modelling
3	GEOL 760 Geochemical and Biogeochemical Modelling
3	GEOL 770 Subsurface Methods
3	GEOL 790 Problems in Geology

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 Data Interpretation
3	GEOL 520 Geomorphology
or	
3	GEOL 630 Sedimentology – Stratigraphy
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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For more information about Kansas State University, contact:

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119 Anderson Hall
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1-800-432-8270 (toll free) or
785-532-6250
k-state@k-state.edu
k-state.edu/admissions

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Post-Graduation Statistics
k-state.edu/postgrad-stats
ksdegreestats.org