

# DOCTOR OF PHILOSOPHY IN NATURAL SCIENCES: GEOSCIENCES

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## Student Learning Outcomes

Students graduating from this program will:

- Demonstrate a thorough degree of knowledge in the disciplines
- Demonstrate an ability to use proper investigation techniques for the disciplines
- Use oral and written forms of communication to convey their ideas

## Program Structure

**Total Credits Required for Graduation:** 42\*

**Residency requirements:** Ph.D. students must satisfy the doctoral residency requirement by satisfactory completion of at least 18 credits in no more than 24 consecutive months. When satisfying the residency requirement, all Ph.D. students are subject to the following restrictions:

- The doctoral residency requirement must be satisfied no later than the end of the semester in which the student completes his or her comprehensive examinations.
- Students must achieve a cumulative graduate grade-point average of at least 3.0 in all courses counted toward satisfying the residency requirement.

\* *Specific disciplines may require more credit hours for graduation. See discipline specific coursework requirements for more information on total credit hours required for graduation.*

## Program Requirements

The coursework requirements encompass:

- A minimum of 12 credit hours of coursework within the primary area, accompanied by at least 12 dissertation hours. The primary disciplines retain the flexibility to potentially request more than the minimum credit hours.
- A minimum of 9 credit hours within a secondary discipline area, with the secondary discipline also having the option to specify additional credit hours beyond the minimum.
- A minimum of 30 classroom credits is required beyond the baccalaureate, including fundamental and advanced courses along with seminars.
- Any primary area discipline can be combined with any secondary area discipline.

## Participating Disciplines

Participating disciplines encompass a range of fields, including:

- Biomedical and Health Informatics
- Cell Biology and Biophysics
- Chemistry
- Geosciences
- Mathematics
- Molecular Biology and Biochemistry
- Oral and Craniofacial Sciences
- Pharmaceutical Science
- Pharmacology
- Physics

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Students graduating from this program will:

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## Geosciences

### Primary Discipline Program Requirements

The Ph.D. program requires a minimum of 12 credit hours of coursework in the primary discipline. Each student's supervisory committee may define other course requirements for the Geosciences primary discipline. At least 50 percent of the coursework taken by a primary discipline student in Geosciences must be courses from the Department of Earth and Environmental Sciences. The courses offered are listed below for consideration.

At least 12 dissertation hours in the primary discipline are also required.

Code	Title	Credits
A minimum of 12 credit hours of coursework.		12
GEOG 5507	Advanced Geographic Information Science	
GEOG 5544	Advanced Spatial Data Analysis	
GEOG 5597 or GEOLOGY 5597	Graduate Seminar in Geosciences	
GEOG 5502	Environmental Remote Sensing and Digital Image Analysis	
GEOG 5506	Global Environmental Change	
GEOG 5546	Global Water and Sustainability	
GEOG 5548	Satellite Climatology	
GEOG 5598	Special Topics in Geography	
GEOG 5598D	Special Topics in Advanced GIS and Remote Sensing	
GEOG 5598F	Special Topics: Geostatistics and Modeling	
GEOG 5690	Special Research Topics	
GEOLOGY 5516	Understanding and Living with Volcanoes	
GEOLOGY 5521	Advanced Methods for Earth and Environmental Science	
GEOLOGY 5531	X-Ray Diffraction and Fluorescence Methods: X-Ray Mthds Geol/Anly	
GEOLOGY 5534	Hazardous Waste Operation Management	
GEOLOGY 5535	Aqueous Geochemistry	
GEOLOGY 5536	Introduction to Scanning Electron Microscopy Methods	
GEOLOGY 5541	Environmental Geophysics	
GEOLOGY 5570	Advanced Hydrogeology	
GEOLOGY 5572	Earthquake Geology	
GEOLOGY 5598	Special Topics in Urban Environmental Geology	
GEOLOGY 5598E	Special Topics in Energy and Mineral Resources	
GEOLOGY 5598I	Special Topics In Urban Environmental Geology	
GEOLOGY 5690	Special Research Topics	
Dissertation		12

**Total Credit Hours: 42**

### Secondary Discipline Program Requirements

Code	Title	Credits
A minimum of 9 credit hours in Geosciences.		9
<b>Total Credits</b>		<b>9</b>

## Admission Requirements

Specific admission requirements defined by the faculty in Geosciences follow the guidelines established by the School of Graduate Studies. Typically, a student would be expected to hold an undergraduate or master's degree in environmental sciences, geology, geography or a closely related field. Opportunities within the department range from the physical sciences to the humanities. Because of the wide range of faculty expertise, and in keeping with the general spirit of the entire PhD program, the faculty in Geosciences has deliberately chosen to establish broad guidelines for admission of Ph.D. students. All prospective graduate students must attain a GPA of 3.0 or above, on a 4.0 scale, in all university work prior to admission. Three letters of recommendation from professors as well as a proposal from the prospective student detailing goals and expectations are needed for an evaluation of the application. Students are expected to have an advisor at the time of admission.

Non-native English-speaking applicants seeking Geosciences as a primary discipline must demonstrate proficiency in English. This requirement can be satisfied by obtaining English proficiency certification from UMKC.

## **Other Discipline-Specific Special Requirements**

While there is no set minimum number of hours for all students, at least 50 percent of the course credit hours for students who select Geosciences as their primary discipline must be taken in Geosciences. Students are expected to take no less than three courses from Geosciences as determined by their supervisory committee. Other special requirements are defined by the student's supervisory committee in individual consultation with each student.

## **Requirements for Comprehensive Examinations**

Comprehensive examinations of all Ph.D. students who select Geosciences as the primary discipline will contain both written and oral components and may include questions from related fields as determined by the student's examining committee. The examining committee consists of the student's supervisory committee and others who may be appointed by the dean of the School of Graduate Studies.

## **Interdisciplinary Work**

The faculty in Geosciences are committed to an interdisciplinary approach and expect that all Ph.D. students, will complete courses and conduct research with this principle in mind.