Department of Geosciences

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Courses in the Department of Geosciences are designed to meet the General Education needs of all students, to broaden their knowledge of the physical environment, to enhance their cultural development, and to provide a solid foundation for those planning to enter fields in which geographical and geological knowledge is essential.

The department offers programs leading to a Bachelor of Science degree with a major in Geoscience and concentrations in Geography or Geology. To provide the student with maximum opportunities for career preparation, the two concentrations are subdivided into six career patterns: geography for teachers, geography, and geographic techniques within the Geography concentration; and geology, earth science, and earth science for teachers within the Geology concentration. Proper selection of courses will permit a student to work as a professional in a chosen area, pursue graduate studies, or be licensed to teach.

Minors in Geography, Geology/Earth Science, and Remote Sensing are offered, and the department participates in the Environmental Science and Technology major.

The Geosciences Department also sponsors an internship program which provides opportunities to receive on-the-job training with various agencies employing persons with geographic/geologic training. Details of this program may be obtained from the department.

Curricular listings include General Education requirements in Communication, History, Humanities and/or Fine Arts, Mathematics, Natural Sciences, and Social/Behavioral Sciences categories as outlined on pages 64–67.

Major in Geoscience

All students pursuing the major in Geoscience must complete the General Education requirements and the departmental core requirements as follows:

GEOL 1030 Introduction to Earth Science, 3 hours*
GEOL 1031 Introduction to Earth Science Lab, 1 hour*
OR student may substitute GEOL 1040/1041 Physical Geology for GEOL 1030/1031
GEOG 2000 Introduction to Regional Geography, 3 hours**

Additionally:

For Geography concentration:
GEOG 4380 Cartography, 4 hours

For Geology concentration:
GEOL 3050 Field Methods in Geology, 2 hours
GEOL 3060 Computer Methods in Geology, 3 hours

**Can also serve as part of General Education requirement for Natural Sciences*
***Can also serve as part of General Education requirement for Social/Behavioral Sciences*

Following is a suggested pattern of study for the first two years; however, **consultation with the assigned advisor is necessary before registration.**

Recommended Curriculum

FRESHMAN		**SOPHOMORE**	
ENGL 1010, 1020 (Comm)	6	ENGL 2020 or 2030 or HUM 2610 (Hum/FA)	3
Natural Sciences (2 prefixes)	8	Humanities and/or Fine Arts (2 prefixes)	6
Social/Behavioral Sciences	3	HIST 2010, 2020, or 2030	6
COMM 2200 (Comm)	3	Social/Behavioral Sciences	3
Requirements as advised	10	Mathematics	3
	30	Requirements as advised	9
			30

Concentration: Geography

Career Pattern: **Geography for Teachers**

This program offers preparation for the student to meet professional requirements for teaching geography in the public schools and for graduate studies. This career pattern requires a minimum of 75 hours (in addition to the departmental core requirements).

Required courses (7 hours)
GEOG 3401 or 3402 Field Course
GEOG 4360 Cultural Geography

17 hours from
GEOG 3120 Geography of Tennessee
GEOG 3410 Geography of the United States and Canada
GEOG 3420 Geography of Latin America
GEOG 3430 Geography of Europe
GEOG 3440 Geography of Asia
GEOG 3460 Geography of the Former Soviet Union
GEOG 3470 Geography of Africa
GEOG 4280 Special Problems and Topics in Geography
GEOG 4310 Resource Management and Conservation
GEOG 4320 Economic Geography
GEOG 4330 Political Geography
GEOG 4340 Historical Geography
GEOG 4370 Urban Geography
GEOG 4470 Rural Settlement
GEOG 4500 Geography of the Middle East
GEOG 4540 Geography of Native Americans
GEOG 4550 Global Issues

Departmental Elective (3 hours)

In addition to major courses, the student must meet the following requirements:

1. A cognate (additional general education requirements) of 18 hours:
   ANTH 2010 Cultural Anthropology
   PS 1010 Foundations of Government
   PS 3210 International Relations
   PS 4220 World Politics
   PS 4240 American Foreign Policy
   SOC 1010 Introductory Sociology
2. A minor in Secondary Education (30 hours), involving education courses and directed teaching. Student must contact Secondary Education minor advisor for approval of appropriate courses for licensure. For specific procedures and additional requirements for teacher licensure, see appropriate catalog section.

NOTE: *Please see the Educational Leadership Department on page 166 for information on Secondary Education minor.*

Concentration: Geography

Career Pattern: **Geography**

This program is designed for students who plan to become professional geographers or who wish to pursue graduate study in geography and/or related fields. This career pattern requires a minimum of 75 hours (in addition to the departmental core requirements).

Required courses: (21 hours)
GEOG 1030 Physical Geography
GEOG 4360 Cultural Geography
GEOG 3401 or 3402 Field Course
GEOG 4550 Global Issues
GEOG 4490 Remote Sensing OR
GEOG 4520 Image Interpretation
GEOG 4530 Geographic Information Systems

Two of the following regional courses: (6 hours)
GEOG 3120 Geography of Tennessee
GEOG 3410 Geography of the United States and Canada
GEOG 3420 Geography of Latin America
GEOG 3430 Geography of Europe
GEOG 3440 Geography of Asia
GEOG 3460 Geography of the Former Soviet Union
GEOG 3470 Geography of Africa
GEOG 4500 Geography of the Middle East

Two of the following topical courses: (6 hours)
GEOG 4310 Resource Management and Conservation
GEOG 4320 Economic Geography
GEOG 4330 Political Geography
GEOG 4340 Historical Geography
GEOG 4370 Urban Geography
GEOG 4470 Rural Settlement
GEOG 4480 Recreational Geography
GEOG 4540 Geography of Native Americans

General Electives (6 hours)

Two minors (18 hours each) are required. These are to be selected in consultation with and approved by the major academic advisor.

Concentration: Geography

Career Pattern: **Geographic Techniques**

This program provides basic skills in the methods used to acquire, analyze, and present spatial information about the Earth's surface. These techniques are widely employed by government and industry in natural resource and environmental management, urban and regional planning, utility management, and transportation planning. This career pattern requires a minimum of 75 hours (in addition to the departmental core requirements).

Required courses: (30 hours: 26 in GEOG and 4 in GEOL)
GEOG 1030 Physical Geography
GEOG 3401 or 3402 Field Course
GEOG 4490 Remote Sensing
GEOG 4510 Laboratory Problems in Remote Sensing
GEOG 4520 Image Interpretation
GEOG 4530 Geographic Information Systems
GEOG 4570 Advanced Geographic Information Systems
GEOL 4020 Geomorphic Regions of the United States

Departmental Elective (3 hours)

General Electives (6 hours)

Two minors (18 hours each) are required. These are to be selected in consultation with and approved by the major academic advisor.

Minor in Geography

The minor in Geography requires 18 hours (all in courses with a GEOG designation) to be selected by the student and approved by a member of the faculty assigned as advisor. The minor will be specific enough to support the student's career plans.

Concentration: Geology

Career Pattern: **Geology**

This program is designed for students who plan to become professional geologists or who wish to pursue graduate study in geology. The Geology career pattern consists of 93 hours distributed between major field core requirements (12 hours), career pattern requirements (39 hours), two cognates (19 hours and 18 hours), and general electives (5 hours). An additional 27 hours of General Education requirements are required.

Required courses: 39-43 hours
GEOL 1040/1041 Physical Geology/Lab*
GEOL 1050 Historical Geology
GEOL 3000 Mineralogy
GEOL 3050 Field Methods in Geology**
GEOL 3060 Computer Methods in Geology**
GEOL 3160 Geologic Literature and Report Writing
GEOL 4000 Petrology and Petrography
GEOL 4020 Geomorphic Regions of the United States
GEOL 4030 Invertebrate Paleontology
GEOL 4070 Sedimentation and Stratigraphy
GEOL 4080 Structural Geology
GEOL 4100 Geophysical Prospecting
GEOL 4130 Hydrogeology
GEOL 4580 Seminar in Geology

**Not required of students with an A or B in both GEOL 1030 and GEOL 1031*
***Departmental core requirements*

Geology elective to be chosen from the following: (3 hours)
GEOL 3010 Oceanography
GEOL 4140 Inorganic Geochemistry
GEOL 4150 Environmental Applications of Hydrogeology

Two cognates consisting of the following:
Cognate 1: 19 hours
CHEM 1110/1111 General Chemistry I (w/lab)
CHEM 1120/1121 General Chemistry II (w/lab)
MATH 1910 Calculus I
MATH 1920 Calculus II
GEOG 4530 Geographic Information Systems

Cognate 2: 18 hours
BIOL 1110/1111 General Biology
PHYS 2010/2011 Non-Calculus-Based Physics I (w/lab) OR
PHYS 2110/2111 Calculus-Based Physics I (w/lab)
(approved) Geology Field Camp in western U.S.
Math/Science elective (required approval by major academic advisor)
Plus 3 hours of Geoscience electives

Second semester physics (PHYS 2020/2021 or 2120/2121 may be substituted for BIOL 1110/1111. Computer Science I, CSCI 1170, and Probability and Statistics, MATH 2050, are strongly recommended.

Concentration: Geology

Career Pattern: **Earth Science**

The earth science program has two curricula. One, **technical curriculum,** is designed for those desiring a general background in earth science. The second, **Earth Science for Teachers,** is for those planning to teach the earth sciences.

The **technical curriculum** consists of 89 hours distributed between major field core requirements (12 hours), career pattern requirements (11 hours), career pattern electives (18 hours), a cognate (18 hours), a minor (18 hours), and general electives (12 hours). The minor, which must be in Chemistry, Physics, Biology, Mathematics, or Computer Science, will be selected by the student and approved by the major academic advisor. An additional 31 hours of General Education requirements are required.

Required courses: (16-20 hours)
GEOL 1040/1041 Physical Geology/Lab*
GEOL 1050 Historical Geology
GEOL 3010 Oceanography
GEOL 3050 Field Methods in Geology**
GEOL 3060 Computer Methods in Geology**
GEOL 4020 Geomorphic Regions of the United States

**Not required of students with an A or B in both GEOL 1030 and GEOL 1031*
***Departmental core requirements*

Electives to be chosen from the following: (18 hours)*
ABAS 3340 Soil
GEOL 3000 Mineralogy
GEOL 4000 Petrology and Petrography
GEOL 4030 Invertebrate Paleontology
GEOL 4050 Meteorology
GEOL 4070 Sedimentation and Stratigraphy
GEOL 4080 Structural Geology
GEOL 4090 Problems in Geology
GEOL 4100 Geophysical Prospecting
GEOL 4130 Hydrogeology
GEOL 4150 Environmental Applications in Hydrogeology

**22 hours if GEOL 1040/1041 not taken*

Technical Cognate: (18 hours)
GEOG 4530 Geographic Information Systems
MATH 1720 Plane Trigonometry
Additional 12 hours of technical electives to be approved by major academic advisor

Science or Math Minor: (18 hours approved by major academic advisor)

Concentration: Geology

Career Pattern: **Earth Science for Teachers**

The **Earth Science for Teachers** curriculum is designed for those who plan to teach earth science in the secondary school system. This curriculum consists of 97 hours distributed between major field core requirements (12 hours), career pattern requirements (8 hours), career pattern electives (14 hours), a cognate (33 hours), and a minor in Secondary Education (30 hours) involving education courses and directed teaching. An additional 27 hours are required for General Education. Student must contact Secondary Education minor advisor for approval of appropriate courses for licensure. For specific procedures and additional requirements for teacher licensure, see appropriate catalog section.

NOTE: *Please see the Educational Leadership Department on page 166 for information on the Secondary Education minor.*

Required Courses: (8 hours)
GEOL 1050 Historical Geology
GEOL 3401 or 3402 Field Course

Fourteen (14) hours of electives to be chosen from:
GEOL 3000 Mineralogy
GEOL 3010 Oceanography
GEOL 4000 Petrology and Petrography
GEOL 4020 Geomorphic Regions of the United States
GEOL 4030 Invertebrate Paleontology
GEOL 4070 Sedimentation and Stratigraphy
GEOL 4080 Structural Geology
GEOL 4130 Hydrogeology
GEOG 4310 Resource Management and Conservation
GEOG 4490 Remote Sensing
ABAS 3340 Soil

Math/Science Cognate: (33 hours)
CHEM 1010/1011 General Chemistry I (w/lab)
CHEM 1020/1021 General Chemistry II (w/lab)
PHYS 2010/2011 Non-Calculus-Based Physics I (w/lab)
PHYS 2020/2021 Non-Calculus-Based Physics II (w/lab)
BIOL 1110/1111, 1120/1121 General Biology (w/lab)
MATH 1720 Plane Trigonometry
GEOL 4050 Meterology
ASTR 1030/1031 Exploring the Universe OR
ASTR 3400 Fundamentals of Astrophysics

Minor in Geology/Earth Science

The minor in Geology/Earth Science requires GEOL 1040/1041 (or GEOL 1030/1031 with a grade of A or B) and GEOL 1050 plus 10-14 additional hours at the 3000 level or above.

Minor in Remote Sensing

The minor in Remote Sensing consists of 19 semester hours to be taken in the sequence listed below:
GEOG 1030 Physical Geography
GEOG 4490 Remote Sensing
GEOG 4510 Laboratory Problems in Remote Sensing
GEOG 4520 Image Interpretation
GEOG 4530 Geographic Information Systems

Interdisciplinary Major or Minor in Environmental Science and Technology

The Department of Geosciences participates in an interdisciplinary major in Environmental Science and Technology in conjunction with Agribusiness and Agriscience, Biology, Chemistry, and Engineering Technology. A complete description can be found under the Interdisciplinary Majors and Minors found on page 80.

Courses in Geography [GEOG]

See back of catalog for course descriptions.

Courses in Geology [GEOL]

See back of catalog for course descriptions.

Honors College

The Department of Geosciences offers the following courses in Honors: GEOG 2000, GEOL 1030.

Graduate Study

The department offers minors in Geography and Earth Science/Geology at the graduate level. The list of available courses offered can be found in the Graduate Catalog.