

Geography, B.S.

Requirements

The Bachelor of Science with a major in geography requires a minimum of 120 s.h., including at least 46-49 s.h. of work for the major. Credit required for the major depends on a student's choice of track. Students must maintain a g.p.a. of at least 2.00 in all courses for the major and in all UI courses for the major. They also must complete the College of Liberal Arts and Sciences GE CLAS Core. Transfer students must earn a minimum of 15 s.h. for the major in residence at the University of Iowa.

Geography majors may not earn the minor in geographic information science.

The major in geography is appropriate preparation for advanced training or careers in geographical and sustainability sciences. Students with strong interest in quantitative analysis and model building should pursue the Bachelor of Science and are encouraged to master an appropriate computer programming language.

Students choose one of three tracks in the major: environmental studies, geographic information science (GISci), or health and society. All students majoring in geography complete a common set of foundation courses in addition to the requirements for their choice of track. Bachelor of Science students take additional mathematics coursework.

Consistent with the College of Liberal Arts and Sciences maximum semester hours rule, students may count a maximum of 56 s.h. earned in their major department toward graduation.

The B.S. with a major in geography requires the following work.

| Code | Title | Hours |
|--|-------|-------|
| Common Requirements | | 18-23 |
| Statistics, Mathematics, or Computer Science Courses | | 10 |
| Track Courses | | 15-19 |

Common Requirements

Students may not use a course to fulfill more than one major requirement.

| Code | Title | Hours |
|------------------------|---|-------|
| All of these: | | |
| GEOG:1020 | The Global Environment | 3 |
| GEOG:1021 | The Global Environment Lab | 1 |
| GEOG:1050 | Foundations of GIS | 4 |
| GEOG:1090 | Globalization and Geographic Diversity | 3 |
| One of these: | | |
| GEOG:1060 | Geography of Asia: From Japan to Pakistan | 3 |
| GEOG:1070 | Contemporary Environmental Issues | 3 |
| GEOG:2110/ GHS:2110 | Seven Billion and Counting: Introduction to Population Dynamics | 3 |
| GEOG:2910 | The Global Economy | 3 |
| GEOG:2950 | Environmental Conservation | 4 |

One of these (not required for GISci track students):

| | | |
|--------------------------------------|--|---|
| GEOG:3340 | Ecosystem Services | 3 |
| GEOG:3500/ IGPI:3500 | Introduction to Environmental Remote Sensing | 3 |
| GEOG:3520/ IGPI:3520 | GIS for Environmental Studies | 3 |
| GEOG:3540/ IGPI:3540 | Geographic Visualization | 3 |
| GEOG:3570 | Light Detection and Ranging (LiDAR): Principles and Applications | 3 |
| GEOG:4010 | Field Methods in Physical Geography | 3 |
| GEOG:4150/ GHS:4150/ IGPI:4150 | Health and Environment: GIS Applications | 3 |
| GEOG:4650 | Simulation in Environmental Geography | 3 |

One of these:

| | | |
|-----------|---|---|
| GEOG:4030 | Senior Project Seminar (offered only in spring semesters) | 3 |
| GEOG:4995 | Honors Thesis (must enroll for 3 s.h. and make arrangements with a faculty advisor) | 3 |

One of these (at least 1 s.h. required):

| | | |
|-----------|--|------|
| GEOG:3400 | Iowa Environmental Policy in Practice | 3 |
| GEOG:3992 | Undergraduate Research (including ICIGO or independent research) | arr. |
| CCP:1201 | Academic Internship | 1-3 |

Senior Project Seminar (GEOG:4030) is offered only in spring semesters. Students who choose GEOG:4995 Honors Thesis must make arrangements with a faculty advisor.

The Department of Geographical and Sustainability Sciences is a participant in the University's internship program, which provides opportunities for students to participate in paid and unpaid activities related to their academic programs. The Pomerantz Career Center works with students to develop appropriate internships.

Statistics, Mathematics, or Computer Science Courses

Students must earn a minimum of 10 s.h. in statistics, mathematics, or computer science coursework by completing the following. Equivalent courses and courses with a higher course number also may be selected in consultation with, and approval by, an advisor.

Students who complete the GIS track may not double count their required computer science courses for the statistics, mathematics, or computer science courses requirement.

| Code | Title | Hours |
|----------------------------------|-----------------------------------|-------|
| Both of these: | | |
| STAT:2010 | Statistical Methods and Computing | 3 |
| STAT:3200/ IGPI:3200/ISE:3760 | Applied Linear Regression | 3 |

One of these:

| | | |
|-----------|--|---|
| CS:1210 | Computer Science I: Fundamentals | 4 |
| CS:2110 | Programming for Informatics | 4 |
| CS:2230 | Computer Science II: Data Structures | 4 |
| MATH:1380 | Calculus and Matrix Algebra for Business | 4 |
| MATH:1460 | Calculus for the Biological Sciences | 4 |

Tracks

All geography majors must complete one of the three tracks described below: environmental studies, geographic information science (GISci), or health and society. Students should pay close attention to prerequisites for the upper-level courses in each track in order to develop a study plan that allows them to complete their major in a timely way.

Students in the environmental studies or health and society track who wish to gain additional experience in theory and application of geographic information systems (GIS) should take GIS-based courses offered by the Department of Geographical and Sustainability Sciences, as described for each track below.

Students may use GEOG:3001 Special Topics to fulfill a track requirement if the course content is applicable.

Environmental Studies Track

The environmental studies track requires a minimum of 15 s.h. It is designed for students interested in the interrelationships among social and natural processes that affect the environment. The track prepares students for careers or pursuit of personal interests in resource management, landscape ecology, water resources, environmental policy or law, global environmental change, sustainable development, or other complex environmental issues. Graduates may find employment in an environmental profession such as conservation, environmental planning and regulation, or environmental law, policy, and politics.

The environmental studies track offers training in field observation, remote sensing, geographical information systems, quantitative analysis/computing, and cartographic representation. It also provides a sound foundation for graduate or professional-level studies in the natural or social aspects of the environment.

In addition to the common requirements, students in the environmental studies track complete a common track course (3 s.h.) and at least 12 s.h. of upper-level geographical and sustainability sciences courses.

| Code | Title | Hours |
|---|-----------------------------------|-------|
| Common course—all environmental studies track students take this: | | |
| GEOG:1070 | Contemporary Environmental Issues | 3 |

Students choose a total of four upper-level courses (at least 12 s.h.) from the following, in consultation with their advisor. Those who wish to gain additional experience in theory and application of GIS systems should take GEOG:3520 GIS for Environmental Studies and GEOG:4520 GIS for Environmental Studies: Applications, or they should earn 6 s.h. in other GIS-based geographical and sustainability sciences courses.

| Code | Title | Hours |
|--------------------------------------|---|-------|
| At least one of these: | | |
| GEOG:2310/ EES:2310 | Introduction to Climatology | 3 |
| GEOG:2374/ BIOL:2374 | Biogeography | 3 |
| GEOG:2410 | Environment and Development | 3 |
| GEOG:2930 | Water Resources | 3 |
| GEOG:3500/ IGPI:3500 | Introduction to Environmental Remote Sensing | 3 |
| GEOG:3520/ IGPI:3520 | GIS for Environmental Studies | 3 |
| At least one of these: | | |
| GEOG:3310 | Landscape Ecology | 3 |
| GEOG:3315 | Ecosystem Ecology | 3 |
| GEOG:3320/ EES:3260 | Wetlands: Function, Geography, and Management | 3 |
| GEOG:3340 | Ecosystem Services | 3 |
| GEOG:3350 | Urban Ecology | 3 |
| GEOG:3400 | Iowa Environmental Policy in Practice | 3 |
| GEOG:3760/ GHS:3760 | Hazards and Society | 3 |
| GEOG:3920/ URP:3001 | Planning Livable Cities | 3 |
| GEOG:4010 | Field Methods in Physical Geography | 3 |
| GEOG:4200/ SUST:4200 | Sustainability as a System Science | 3 |
| GEOG:4470 | Ecological Climatology | 3 |
| GEOG:4500/ IGPI:4500 | Advanced Remote Sensing | 4 |
| GEOG:4520/ IGPI:4520 | GIS for Environmental Studies: Applications | 3 |
| GEOG:4650 | Simulation in Environmental Geography | 3 |
| GEOG:4750/ URP:4750 | Environmental Impact Analysis | 3 |
| GEOG:4770/ AFAM:4770/ GHS:4770 | Environmental Justice | 3 |

Geographic Information Science Track

The geographic information science track (GISci) requires a minimum of 18-19 s.h. It is designed for students preparing for positions in government agencies, nongovernment organizations, international development agencies, and business. It also provides preparation for graduate study in geography, planning, and other disciplines. The track focuses on the design, implementation, and use of geographic information systems. Courses address how geographic data are acquired, stored, accessed, displayed, managed, and analyzed.

Students in the geographic information science track learn to address problems involved in modeling environmental systems, identifying the best locations for service facilities, assessing environmental impacts, and forecasting the populations of small areas. They use the department's

Geographical Information Systems Instructional Lab (GISIL) extensively to develop expertise in using GIS software.

Coursework in the track covers methods of spatial analysis and geographical modeling and involves database management and computer programming.

In addition to the common requirements, students in the geographic information science track complete a common track course (3-4 s.h.) and at least 15 s.h. of upper-level geographical and sustainability sciences courses.

| Code | Title | Hours |
|---|----------------------------------|-------|
| Common course—all GISci track students take one of these: | | |
| CS:1110 | Introduction to Computer Science | 3 |
| CS:1210 | Computer Science I: Fundamentals | 4 |
| CS:2110 | Programming for Informatics | 4 |

Students choose a total of five upper-level courses (at least 15 s.h.) from the following, in consultation with their advisor. GISci track students are encouraged to add breadth to their degree by taking additional upper-level courses in the department. Students interested in the application of GIS to environmental issues should select additional courses from the department's environmental studies area; those interested in health or other socioeconomic issues should select additional courses from the department's health and society area.

| Code | Title | Hours |
|--------------------------------------|--|-------|
| At least one of these: | | |
| GEOG:3050/ IGPI:3050 | Geospatial Programming | 3 |
| GEOG:3500/ IGPI:3500 | Introduction to Environmental Remote Sensing | 3 |
| GEOG:3520/ IGPI:3520 | GIS for Environmental Studies | 3 |
| GEOG:3540/ IGPI:3540 | Geographic Visualization | 3 |
| GEOG:4650 | Simulation in Environmental Geography | 3 |
| At least one of these: | | |
| GEOG:3340 | Ecosystem Services | 3 |
| GEOG:3760/ GHS:3760 | Hazards and Society | 3 |
| GEOG:4010 | Field Methods in Physical Geography | 3 |
| GEOG:4150/ GHS:4150/ IGPI:4150 | Health and Environment: GIS Applications | 3 |
| At least one of these: | | |
| GEOG:3570 | Light Detection and Ranging (LiDAR): Principles and Applications | 3 |
| GEOG:4500/ IGPI:4500 | Advanced Remote Sensing | 4 |
| GEOG:4520/ IGPI:4520 | GIS for Environmental Studies: Applications | 3 |
| GEOG:4580/ IGPI:4581 | Introduction to Geographic Databases | 3 |

Health and Society Track

The health and society track requires a minimum of 15 s.h. It is designed for students interested in understanding the causes and consequences of social inequalities, the long-term effects that changing human/environmental interactions have on human health, and emerging transnational challenges to the sustainability of livelihoods. The track provides students with foundational knowledge and skills to support postgraduate employment in governmental or nongovernmental positions, graduate study in public health or in health-related fields, and service experiences such as the Peace Corps and AmeriCorps.

Students gain understanding of the factors and processes that determine geographic patterns of health. They explore the effects of the social, built, and natural environments on the physical, social, and mental health of populations. Coursework in the track examines patterns and causes of infectious and chronic diseases; hazards, vulnerability, and environmental justice; and the spatial methods used to understand such issues.

Thematic content from courses is complemented by quantitative, spatial, and statistical analysis coursework, enabling students to analyze and understand geographic patterns of health. Students have opportunities to work on applied problems, such as assessing patterns of disease, identifying the underlying population and environmental drivers of good or poor health, and evaluating the social dimensions of environmental impacts.

In addition to satisfying the common requirements, students in the health and society track complete three common track courses (9 s.h.) and at least two upper-level geographical and sustainability sciences courses (6 s.h.).

| Code | Title | Hours |
|--|---|-------|
| Common courses—all health and society track students take these: | | |
| GEOG:2110/ GHS:2110 | Seven Billion and Counting: Introduction to Population Dynamics | 3 |
| GEOG:3110/ GHS:3111 | Geography of Health | 3 |
| GEOG:4150/ GHS:4150/ IGPI:4150 | Health and Environment: GIS Applications | 3 |
| At least two of these: | | |
| GEOG:3070/ GHS:3070 | Hungry Planet: Global Geographies of Food | 3 |
| GEOG:3210/ CPH:3400 | Health, Work, and the Environment | 3 |
| GEOG:3300/ GHS:3300 | Envisioning Future Worlds: Sustainable Development and Its Alternatives | 3 |
| GEOG:3760/ GHS:3760 | Hazards and Society | 3 |
| GEOG:3920/ URP:3001 | Planning Livable Cities | 3 |

| | | |
|--------------------------------------|-----------------------|---|
| GEOG:4770/ AFAM:4770/ GHS:4770 | Environmental Justice | 3 |
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Teacher Licensure

Students interested in teaching in elementary and/or secondary schools should seek admission to the Teacher Education Program (TEP) in the College of Education.

To qualify for licensure in secondary teaching, students in the TEP complete a degree in education as well as a related College of Liberal Arts and Sciences degree. See Apply on the College of Education website for details on requirements and deadlines for applying to the College of Education and about TEP choices of majors leading to licensure.