Geographical and Sustainability Sciences, BS

Learning Outcomes

Graduates will:

- understand the complex processes that connect humans to natural systems and the analytical and methodological tools used to model them and assess them;
- develop fundamental spatial thinking and real-world problem-solving skills using spatial thinking and GIS concepts and methods;
- analyze the potential impact of decisions given competing information, perceptions, and goals using interdisciplinary science-based methods and approaches;
- be able to use and develop techniques and software tools necessary for professional practice while observing ethical standards in regard to privacy, security, and communication;
- engage with stakeholders in the co-production and creation of appropriate solutions to sustainability challenges.

Requirements

The Bachelor of Science with a major in geographical and sustainability sciences requires a minimum of 120 s.h., including 69–74 s.h. of work for the major depending on a student's choice of track (geographic information science or sustainability science). Students must maintain a grade-point average of at least 2.00 in all courses for the major and in all UI courses for the major. They must also complete the College of Liberal Arts and Sciences GE CLAS Core. Transfer students must complete a minimum of 15 s.h. of School of Earth, Environment, and Sustainability coursework in the major.

The BS with a major in geographical and sustainability sciences requires the following coursework.

Requirements	Hours
Foundation Courses	27-28
Track Requirements	42-46

Foundation Courses

Course #	Title	Hours
All of these:		
SEES:1070	Contemporary Environmental Issues	3
SEES:1085	Fundamentals of Environmental Science	4
SEES:2010	Interdisciplinary Environmental Seminar	1
SEES:2050	Foundations of GIS	4
One of these:		
SEES:2310	Introduction to Climatology	3
SEES:2374/ BIOL:2374	Biogeography	3
SEES:2930	Water Resources	3
SEES:2950	Environmental Conservation	4
SEES:3320	Earth's Climate System	3
One of these:		
SEES:1090	Globalization and Geographic Diversity	3
SEES:2110/ GHS:2110	Eight Billion and Counting: Introduction to Population Dynamics	3
SEES:2910	The Global Economy	3
One of these:		
CS:1110	Introduction to Computer Science	3
STAT:2010	Statistical Methods and Computing	3
STAT:3200/ DATA:3200/ IGPI:3200/ISE:3760	Applied Linear Regression	3
At least one of these (for a total of 3 sh):		
SEES:3400	Iowa Environmental Policy in Practice	3
SEES:3992	Undergraduate Research (or ICIGO)	1-3
CCP:1201	Academic Internship	1-3
One of these:		
SEES:4030	Senior Project Seminar	3
SEES:4995	Honors Thesis	3

Tracks

Students must complete one of two tracks: geographic information science or sustainability science. Students may not use any course to satisfy more than one requirement.

Geographic Information Science Track

Students in the geographic information science track complete 30—31 s.h. in common track courses and at least 12 s.h. in elective courses.

Geographic Information Science Track Courses

Course #	Title	Hours
All of these:		
SEES:1020	The Global Environment	3
SEES:1035	Our Digital Earth	3
SEES:3050/ IGPI:3050	Geospatial Programming	3
SEES:3500/ IGPI:3500	Introduction to Environmental Remote Sensing	3
SEES:3520/ IGPI:3520	GIS for Environmental Applications	3
SEES:3540/ IGPI:3540	Geographic Visualization	3
SEES:4010	Field Methods in Physical Geography	3
SEES:4580/ IGPI:4581	Introduction to Geographic Databases	3
Two of these:		
SEES:3570	Light Detection and Ranging (LiDAR): Principles and Applications	3

SEES:4150/ GHS:4150/ IGPI:4150	Health and Environment: GIS Applications	3
SEES:4500/ IGPI:4500	Advanced Remote Sensing	4
SEES:4520/ IGPI:4520	GIS for Environmental Studies: Applications	3

Geographic Information Science Track Electives

Students in the geographic information science track complete at least 12 s.h. in track electives, including at least 3 s.h. selected from each of three categories: computer science; math and statistics; and society, environment, and sustainability.

Computer Science Elective Courses

Course #	Title	Hours
At least one of these:		
CS:1210	Computer Science I: Fundamentals	4
CS:2110	Programming for Informatics	4
CS:2210	Discrete Structures	3
CS:2230	Computer Science II: Data Structures	4
CS:3210	Programming Languages and Tools	arr.

Mathematics and Statistics Elective Courses

Course #	Title	Hours
At least one of these:		
MATH:1010	Trigonometry	3
STAT:2010	Statistical Methods and Computing	3
STAT:3200/ DATA:3200/ IGPI:3200/ISE:3760	Applied Linear Regression	3
STAT:3510/ IGPI:3510	Biostatistics	3

Society, Environment, and Sustainability Elective Courses

Course #	Title	Hours
At least one of these:		
SEES:3090/ GHS:3070	Hungry Planet: Global Geographies of Food	3
SEES:3110/ GHS:3111	Geography of Health	3
SEES:3315	Ecosystem Ecology	4
SEES:3340	Ecosystem Services	3
SEES:3350	Urban Ecology	3
SEES:3760/ GHS:3760	Hazards and Society	3
SEES:3920/ URP:3001	Planning Livable Cities	3
SEES:4210	Sustainability as a System Science	3
SEES:4310	Climate Change	3
SEES:4470	Ecological Climatology	3
SEES:4750/ URP:4750	Environmental Impact Analysis	3
SEES:4770/ AFAM:4770/ GHS:4770	Environmental Justice	3

Sustainability Science Track

Students in the sustainability science track complete 24—25 s.h. in common track courses and at least 21 s.h. in elective courses.

Sustainability Science Track Courses

Course #	Title	Hours
All of these:		
SEES:2013/ BUS:2013/ URP:2013	Introduction to Sustainability	3
SEES:2110/ GHS:2110	Eight Billion and Counting: Introduction to Population Dynamics	3
SEES:2310	Introduction to Climatology	3
SEES:3800	Environmental Policy	3
SEES:4210	Sustainability as a System Science	3
One of these:		
SEES:4770/ AFAM:4770/ GHS:4770	Environmental Justice	3
POLI:2417	Comparative Environmental Policy	3
One of these:		
SEES:2673/ BIOL:2673	Ecology	3
SEES:3315	Ecosystem Ecology	4
One of these:		
SEES:2950	Environmental Conservation	4
SEES:3350	Urban Ecology	3

Sustainability Science Track Electives

Students in the sustainability science track complete at least 21 sh. in track electives, including at least 3 s.h. selected from each of five categories: communications, human systems, integrated natural and human systems, methods, and natural systems. Courses taken to complete a foundation course or track requirement may not also be used to satisfy the electives requirement.

Communications Elective Courses

Course #	Title	Hours
At least one of these:		
CNW:3664/ ENGL:3764	Writing About Science	3
JMC:1800	Environmental Communication	3
JMC:3185	Topics in Understanding Media	3

Human Systems Elective Courses

Course #	Title	Hours
At least one of these:		
SEES:3300/ GHS:3300	Envisioning Future Worlds: Sustainable Development and Its Alternatives	3

SEES:3780/ GHS:3780/ HIST:3240/ POLI:3431	U.S. Energy Policy in Global Context	3
SEES:3920/ URP:3001	Planning Livable Cities	3
SEES:4750/ URP:4750	Environmental Impact Analysis	3
SEES:4770/ AFAM:4770/ GHS:4770	Environmental Justice	3
ECON:3650	Policy Analysis	3
ENTR:3700	Sustainable Innovation and Management	3
POLI:2417	Comparative Environmental Policy	3

Integrated Natural and Human Systems Elective Courses

Course #	Title	Hours
At least one of these:		
SEES:2930	Water Resources	3
SEES:2950	Environmental Conservation	4
SEES:3331	Human Dimensions of Climate	3
SEES:3760/ GHS:3760	Hazards and Society	3
SEES:4310	Climate Change	3
ANTH:2261	Human Impacts on the Environment	3

Methods Elective Courses

Course #	Title	Hours
At least one of these:		
SEES:3500/ IGPI:3500	Introduction to Environmental Remote Sensing	3
SEES:3520/ IGPI:3520	GIS for Environmental Applications	3
SEES:3570	Light Detection and Ranging (LiDAR): Principles and Applications	3
SEES:4010	Field Methods in Physical Geography	3
SEES:4150/ GHS:4150/ IGPI:4150	Health and Environment: GIS Applications	3
SEES:4500/ IGPI:4500	Advanced Remote Sensing	4
SEES:4520/ IGPI:4520	GIS for Environmental Studies: Applications	3

Natural Systems Elective Courses

Course #	Title	Hours
At least one of these:		
SEES:2673/ BIOL:2673	Ecology	3
SEES:3070	Marine Ecosystems and Conservation	3
SEES:3080	Introduction to Oceanography	2
SEES:3095	Field Ecology	4
SEES:3315	Ecosystem Ecology	4
SEES:3350	Urban Ecology	3
SEES:3360	Soil Genesis and Geomorphology	3
SEES:4110	Global Biogeochemical Cycles	3
SEES:4470	Ecological Climatology	3
SEES:4600	Biogeography, Ecology, and Conservation of Mammals	4
Iowa Lakeside Laboratory course (prefix IALL) approved by advisor		

Honors

Graduating with departmental honors and graduating with university honors are two opportunities available to high-achieving undergraduate students, each with specific and distinct requirements. Some students pursue both options while others pursue one or the other.

Honors in the Major

Within the College of Liberal Arts and Sciences, each major develops its own requirements to achieve honors in the major. In order to graduate with honors in the major, students in the School of Earth, Environment, and Sustainability (SEES) pursue study beyond the typical undergraduate level. They work under the direction of a faculty member to conduct original research and then prepare and present a written honors thesis based on their work.

Potential honors students must complete an honors thesis contract with their advisor and obtain approval from the department's undergraduate committee by the first semester of their senior year or earlier. They are also required to register for SEES:4995 Honors Thesis as they work to complete their thesis, where they must earn a grade of B or higher. Additionally, SEES honors students must maintain a cumulative grade-point average of at least 3.33 in all University of Iowa and SEES coursework.

University of Iowa Honors Program

In addition to honors in the major, students have opportunities for honors study and activities through membership in the University of Iowa Honors Program. Visit Honors at Iowa to learn about the university's honors program.

Membership in the UI Honors Program is not required to earn honors in the geographical and sustainability sciences major.

Career Advancement

Graduates with degrees in geographical and sustainability sciences find jobs and careers with a variety of public, private, and nonprofit organizations with roles ranging from research to outreach. Possible careers include GIS technician, sustainability coordinator/specialist in the private or public sector, state regulatory agency scientist, Environmental Protection Agency scientist, National Resource Conservation Service scientist, academic researcher (requires graduate school), social science teacher, K–12 education teacher, land manager or steward, city planner, natural hazard assessment and mitigation scientist or manager, renewable energy scientist or manager, science writer and communication specialist, water industry researcher, carbon management

policy specialist, nature facility scientist and program manager, and restoration designer and manager.

Academic Plans

Sample Plans

Sample plans represent one way to complete a program of study. Actual course selection and sequence will vary and should be discussed with an academic advisor. For additional sample plans, see MyUI.

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This sample plan is currently being reviewed and will be added at a later date.