GEOGRAPHIC INFORMATION SCIENCE, MINOR

Requirements for a minor may be completed at any campus location offering the specified courses for the minor. Students may not change from a campus that offers their major to a campus that does not offer their major for the purpose of completing a minor.

What is Geographic Information Science?

Geographic Information Science (GIScience) is one of four key sub-disciplines within Geography (along with human geography, physical geography, and environment-society geography). Its primary areas of study include cartography, geographic information systems, remote sensing, and spatial statistics. Students who study GIScience learn how to use the latest tools and techniques to visually represent and analyze spatial data in order to understand and address real-world environmental and social problems. Applications of geographic information science range from emergency response to natural resource management to social policy analysis to location intelligence for business.

You Might Like This Program If...

- You like computers and maps, and want to acquire skills to differentiate yourself in the workforce after graduation.
- You would like to obtain a well-balanced portfolio of skills for geospatial problem solving.
- You would like to gain competence in geospatial techniques that enhance the knowledge, skills, and abilities developed through your major program of study.

Program Requirements

Requirement	Credits
Requirements for the Minor	18

Requirements for the Minor

A grade of C or better is required for all courses in the minor, as specified by Senate Policy 59-10 (https://senate.psu.edu/students/policies-and-rules-for-undergraduate-students/59-00-minors-and-certificates/). In addition, at least six credits of the minor must be unique from the prescribed courses required by a student's major(s).

Code	Title	Credits
Additional Courses		
Additional Courses: Require a grade of C or better		
Select 3 credits of introductory GIScience:		3
GEOG 260	Geographic Information in a Changing World: Introduction to GIScience	
or GEOG 160	Mapping Our Changing World	
Select 6 credits of intermediate GIScience:		6
GEOG 361	Cartography--Maps and Map Construction	
GEOG 362	Remote Sensing and Image Analysis	
GEOG 363	Geographic Information Systems	
GEOG 365	Intermediate GIS Programming	
Select 6 credits of 400-level GIScience:		6
EMSC 460	Environmental Data Analytics	
FOR 455	Remote Sensing and Spatial Data Handling	
GEOG 413	Cryosphere and Climate Systems	
GEOG 462	Advanced Observation of Earth and Its Environment	
GEOG 463	Geospatial Information Management	
GEOG 464	Advanced Spatial Analysis	
GEOG 465	Advanced Geographic Information Systems Modeling	
GEOG 467	Applied Cartographic Design	
GEOG 485	GIS Programming and Software Development	
GEOSC 482	Satellite Remote-Sensing For Earth Observation	
METEO 477	Fundamentals of Remote Sensing Systems	
SOILS 450	Environmental Geographic Information Systems	
SRA 468	Spatial Analysis of Risks	
Select 3 additional credits of GIScience (not taken above):		3
EMSC 460	Environmental Data Analytics	
FOR 255	GPS and GIS Applications for Natural Resources Professionals	
FOR 455	Remote Sensing and Spatial Data Handling	
FORT 260	GIS for Natural Resources Management	
GEOG 265	Fundamentals of Geospatial Data Science	
GEOG 361	Cartography--Maps and Map Construction	
GEOG 362	Remote Sensing and Image Analysis	
GEOG 363	Geographic Information Systems	
GEOG 364	Spatial Analysis	
GEOG 365	Intermediate GIS Programming	
GEOG 413	Cryosphere and Climate Systems	
GEOG 462	Advanced Observation of Earth and Its Environment	
GEOG 463	Geospatial Information Management	
GEOG 464	Advanced Spatial Analysis	
GEOG 465	Advanced Geographic Information Systems Modeling	
GEOG 467	Applied Cartographic Design	
GEOG 485	GIS Programming and Software Development	
GEOSC 482	Satellite Remote-Sensing For Earth Observation	
METEO 477	Fundamentals of Remote Sensing Systems	
SOILS 450	Environmental Geographic Information Systems	
SRA 468	Spatial Analysis of Risks	
WILDL 211	GIS and Aerial Photo Interpretation in Wildlife Management	

Prerequisites not included in Geographic Information Science Minor:

- (GEOG 260 or GEOG 160) and (GEOG 265 or ERM 300 or GEOG 161 or EME 210 or GEOSC 210 or METEO 273 or MATSE 219 or FOR 255 or FORT 260 or WILDL 211 or CMPSC 101 or CMPSC 121 or CMPSC 131 or IST 140): prerequisite for GEOG 361, GEOG 362, GEOG 363, GEOG 365
- (GEOG 365 or GEOG 485 or GEOG 489 or GEOSC 210 or GEOSC 444 or METEO 273 or EME 210 or MATSE 219 or CMPSC 101 or CMPSC 200 or CMPSC 201) and (MATH 110 or MATH 140 or MATH 140B or MATH 140E or MATH 140G or MATH 140H): prerequisite for EMSC 460
- GEOG 210 or EARTH 2 or EARTH 103N or EARTH 303 or METEO 101 or METEO 201: prerequisite for GEOG 413

- GEOG 361 or GEOG 362 or GEOG 363: prerequisite for GEOG 461
- GEOG 362 or FOR 455 or GEOSC 482 or METEO 477 or EE 477: prerequisite for GEOG 462
- GEOG 363: prerequisite for GEOG 463, GEOG 465, GEOG 485
- GEOG 364: prerequisite for GEOG 464
- GEOG 361: prerequisite for GEOG 467
- FOR 255 or FORT 260 or GEOG 160 or GEOG 260 or WILDL 211: prerequisite for FOR 455
- EE 330 or METEO 436: prerequisite for METEO 477
- SOILS 101: prerequisite for SOILS 450
- IST 210 and SRA 111: prerequisite for SRA 468
- GEOG 160 and GEOG 161: prerequisite for FORT 260
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Academic Advising

The objectives of the university's academic advising program are to help advisees identify and achieve their academic goals, to promote their intellectual discovery, and to encourage students to take advantage of both in-and out-of class educational opportunities in order that they become self-directed learners and decision makers.

Both advisers and advisees share responsibility for making the advising relationship succeed. By encouraging their advisees to become engaged in their education, to meet their educational goals, and to develop the habit of learning, advisers assume a significant educational role. The advisee's unit of enrollment will provide each advisee with a primary academic adviser, the information needed to plan the chosen program of study, and referrals to other specialized resources.

READ SENATE POLICY 32-00: ADVISING POLICY (https://senate.psu.edu/students/policies-and-rules-for-undergraduate-students/32-00-advising-policy/)

University Park

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Career Paths

There are many potential careers for graduates with GIScience backgrounds. Students earning the Geographic Information Science minor learn a wide range of technological, research, and analytical skills that are highly valued by employers. Competence in GIS, mapping, remote sensing, spatial analysis, and geovisualization techniques gives graduates geospatial skills that can help solve real-world problems in fields ranging from business to environmental services to emergency preparedness to policy analysis.

Careers

Students earning the minor in Geographic Information Science are well positioned to find employment with diverse organizations spanning business, government, and nonprofit sectors. Such organizations may include (but are not limited to): American Red Cross; Amnesty International; BAE Systems; Boeing; Esri; Federal Emergency Management Agency; NASA; National Geographic; National Park Service; United Nations; U.S. Army Corps of Engineers; U.S. Census Bureau; U.S. Environmental Protection Agency; local, regional, and state planning agencies; environmental and engineering consulting firms; State Department; and humanitarian organizations.

MORE INFORMATION ABOUT POTENTIAL CAREER OPTIONS FOR GRADUATES WITH A MINOR IN GEOGRAPHIC INFORMATION SCIENCE (https://www.geog.psu.edu)

Opportunities for Graduate Studies

A minor in Geographic Information Science is useful for students who are interested in pursuing graduate degrees in the computational, environmental, and social sciences. Alumni enter graduate and professional studies in a variety of programs, including (but not limited to) geography, planning, urban studies, environmental sciences, ecology, geographic information sciences, information technology, environmental informatics, geodesign, business administration, supply chain management, emergency management, and law. They sometimes begin graduate or professional programs directly after finishing undergraduate studies, but often get several years' work experience before returning to school, either full or part-time.

MORE INFORMATION ABOUT OPPORTUNITIES FOR GRADUATE STUDIES (https://www.geog.psu.edu)

Contact

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