Geographic Information Science (GIS)
Geography: Spatial Analysis
Majors Information Session
Department of Geography
Topics we will cover:

- What is Geographic Information Science and Spatial Analysis?
- What does the GIS major offer?
- What does the Spatial Analysis major offer?
- What can I do with one of these degrees?
  - Careers in GIS/Spatial Analysis
- What does this degree require?
  - Bachelor of Science GE requirements
  - GIS major requirements & course sequencing
  - Spatial Analysis major requirements & course sequencing
- Next steps
What is Geographic Information Science?

- Also known as cartography or spatial analysis
- Combines knowledge from data analytics, computer programming and graphic design to manage and manipulate spatial data so it can be used by companies/clients in decision making processes
- You are making maps!
What do these majors offer?

- OSU is designated a Center for Academic Excellence in Geospatial Sciences by the National Geospatial Intelligence Agency.
- Opportunity to learn the tools and methods needed for effective management and analysis of geographic information.
- Advanced technical knowledge and expertise in spatial data management, statistical analysis, and geovisualization.
How does the GIS major differ?

- Advanced technical knowledge and expertise in spatial data management, statistical analysis, and geovisualization
  - Additional required courses

- GIS is not an engineering degree, but you can pursue a professional certification after graduation.
  - Become a certified GIS Professional (GISP)
  - More info = GIS Certification Institute (leading certification organization in the US)
How does a student declare the GIS or Spatial Analysis major?

- Major has no application, no required courses or minimum GPA to declare
  - However – CSE 1114 and STAT 1450 are required as pre-requisites to courses in the major.
  - **Strongly recommended that students be in good academic standing and have successfully completed Math 1151 or making progress to that completion.**

- Students can declare after attending a major information session
  - A follow-up appointment with a GIS academic advisor to review progress to degree and courses needed next term is expected.
  - Please call 614-292-6961 to schedule this appointment.
What are the career options?

- Geospatial Analyst/Consultant
- Cartographer for the US Defense Mapping Agency or the US Geological Survey
- Manager/Planner for:
  - Transportation
  - Urban development
  - Health services
  - Land use
- GIS Software Developer
- Geospatial Database Administrator
- Market Research/Analyst
Additional Careers

Growing industries
- Information Technology – software developer, IT specialist, database manager
- City and regional planning/development
- Transportation and Logistics
- Environmental mapping and analysis
- National defense and intelligence
- Engineering firms – civil and environmental engineering, especially energy companies
- Financial services – marketing

Helpful websites
- esri.com/careers
- GISjobs.com
GIS and Spatial Analysis are Bachelor of Science (BS) degrees in the College of Arts & Sciences

BS general education requirements apply

- 13 categories
- Math 1151
- Foreign Language Proficiency
  - (1101, 1102 and 1103 in the same language) -- 3 terms to complete
- Three natural sciences; two physical & biological with a lab
- Separate courses for 2nd Writing and Literature categories
- Major/GE Overlap Exception
  - Data Analysis

https://artsandsciences.osu.edu/academics/current-students/advising/ge
Required Courses

Required prerequisites or supplements for the Major

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE 1114</td>
<td>Intro to Databases Using MS Access</td>
<td></td>
</tr>
<tr>
<td>STAT 1450</td>
<td>Intro to the Practice of Statistics</td>
<td>(STAT 2450, STAT 3470)</td>
</tr>
</tbody>
</table>
### Required Courses for GIS Major (11 courses / 33 hours)

**GIS major requirements** (24 hours)
- GEOG 5100  Spatial Data Analysis
- GEOG 5200  Cartography and Map Design
- GEOG 5201  GeoVisualization
- GEOG 5210  Fundamentals of GIS
- GEOG 5212  Geospatial Databases for GIS
- GEOG 5222  GIS Algorithms and Programming
- GEOG 5223  Design and Implementation of GIS
- GEOG 5225  Geographic Applications of Remote Sensing

**Major electives:** Choose three of the following (9 hours)
- GEOG 5226  Spatial Simulation and Modeling in GIS
- GEOG 5229  Emerging Topics in GIS
- GEOG 5***  One 5000-level topical course in Geography
- CSE 2122  Data Structures using C++
- CSE 2123  Data Structures using Java
- CSE 3241  Introduction to Database Systems
- CSE 5242  Advanced Database Management Systems
# Course Offerings and Prerequisites

## Major Required Course

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Offered</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>5100</td>
<td>Spatial Data Analysis</td>
<td>AU, SP</td>
<td>STAT 1450</td>
</tr>
<tr>
<td>5200(S)</td>
<td>Cartography and Map Design</td>
<td>AU, SP</td>
<td>None</td>
</tr>
<tr>
<td>5201</td>
<td>GeoVisualization</td>
<td>AU, SP</td>
<td>5200(S)</td>
</tr>
<tr>
<td>5210</td>
<td>Fundamentals of GIS</td>
<td>AU, SP, SU</td>
<td>None</td>
</tr>
<tr>
<td>5212</td>
<td>Spatial Databases for GIS</td>
<td>AU, SP</td>
<td>5210 and CSE 1114</td>
</tr>
<tr>
<td>5222</td>
<td>GIS Algorithms and Programming</td>
<td>AU, SP</td>
<td>5212</td>
</tr>
<tr>
<td>5223</td>
<td>Design and Implementation of GIS</td>
<td>SP</td>
<td>5222</td>
</tr>
<tr>
<td>5225</td>
<td>Geographic Applications of Remote Sensing</td>
<td>AU, SP</td>
<td>None</td>
</tr>
</tbody>
</table>

## Major Elective Course

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Offered</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>5226</td>
<td>Spatial Simulation and Modeling in GIS</td>
<td>AU</td>
<td>None</td>
</tr>
<tr>
<td>5229</td>
<td>Emerging Topics in GIS</td>
<td>SP</td>
<td>5210</td>
</tr>
</tbody>
</table>
Course Offerings and Time to Completion for GIS

Minimum = four semesters to complete major course sequence

Provided:
Student begins sequence in autumn and enrolls in GEOG 5210 and CSE 1114 concurrently
Starting in spring = minimum of five semesters

Curriculum sequence requires MINIMUM of four semesters to complete

GEOG 5210  →  5212  →  5222  →  5223 (offered SP only)
& CSE 1114

May coincide with 3 semesters of foreign language for GE requirement
Required Courses for Spatial Analysis Major (11 courses / 33 hours)

**Spatial Analysis major requirements** (18 hours)

- GEOG 5100  Spatial Data Analysis
- GEOG 5200  Cartography and Map Design
- GEOG 5201  GeoVisualization
- GEOG 5210  Fundamentals of GIS
- GEOG 5212  Geospatial Databases for GIS
- GEOG 4101  Undergraduate Research and Professionalization Seminar

**Major electives:** Choose five of the following (15 hours; one must be human geography course)

- GEOG 5222  GIS Algorithms and Programming
- GEOG 5223  Design and Implementation of GIS
- GEOG 5225  Geographic Applications of Remote Sensing
- GEOG 5226  Spatial Simulation and Modeling in GIS
- GEOG 5229  Emerging Topics in GIS
- GEOG 5300  Geography of Transportation
- GEOG 5402  Land Use Geography

Choice: Any 3000 to 5000-level human geography course

Choice: Any 3000 to 5000-level physical geography course

CSE 2122 OR 2123 Data Structures using C++ OR Data Structures using Java
Course Offerings and Time to Completion for Spatial Analysis

Geography: Spatial Analysis

- May allow for less time to graduation
  Curriculum requires 2 term sequence (GEOG 5210 → 5212)
  & CSE 1114
- Allows for additional Geography courses
Graduation Requirements

Courses

A grade of C- or better is required for all major courses.

Major courses cannot be taken pass/non-pass.

No more than half of the credit hours on your major program may consist of transfer credit.

GPA

Cumulative GPA of 2.0 is required.
Honors

Must apply through the ASC Honors Office

- [http://aschonors.osu.edu](http://aschonors.osu.edu)
- GPA = 3.5 required
- Need to do early to allow time for completion of requirements
Additional Options

For Minors with Major

- Computer and Information Science (CIS)
- Engineering Sciences
- City and Regional Planning
- Environmental Science
- Global Public Health

As a Minor with Your Major

- Geographic Information Science (GIS)
- Geography
Get Involved!

Student Organization
- Geography Club

Research
- Seek out faculty members

Internship
- Geography 5191
- Opportunity for experience and credit
Next Steps

- Complete Major Information Session Form.
- If you want to declare major or minor in GIS, schedule follow-up appointment with Geography Advisor. Call 614-292-6961.
- If you want to declare a CIS or Engineering minor, schedule follow-up appointment with an advisor in that department.
- Adjust class schedule to new major/minor as needed. Use your degree audit.
Questions?