Geographic Information Systems and Analysis

Instructor

Stephanie Rosoff
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Office hours:
Tuesdays 5pm-6pm or by appointment
Wilf Hall (139 MacDougal Street), Room 209

Schedule

September 5, 2017- December 5,2017
Tu: 6:45pm-8:25pm; 8:35pm-9:25pm
Building: 25W4 Room:C-6

Course Description

Understanding geographic relationships between people, land use, and resources is fundamental to planning. Urban planners routinely use spatial analysis to inform decision-making. This course will introduce students to Geographic Information Systems (GIS), a tool to analyze and visualize spatial data. The course will emphasize the core functions of GIS: map making, data management, and spatial analysis. Students will learn cartographic best practices, how to find and create spatial data, spatial analysis methodology, and how to approach problem solving from a geographic perspective. Throughout the course, students will build a portfolio of professional quality maps and data visualizations.

Objectives

- Students will gain the following skills and abilities:
  - An understanding of what GIS is and how GIS is used in planning and other fields
  - Fluency in the ESRI ArcGIS interface (the most commonly used GIS software package)
  - An understanding of where to find existing GIS data and how to create custom GIS data
  - Ability to make professional quality maps
  - Expertise in working with and visualizing geographic data
  - Ability to solve a “spatial question” using GIS
Course Structure

Prerequisite
There is no formal prerequisite for this class, but the course is very data intensive. Students are expected to know basic data management and manipulation.

Class Format
Most classes will include a lecture introducing a spatial analysis/GIS topic followed by a lab exercise (see class schedule). Materials for the lab exercises will be posted on the NYU Classes course site in advance of each class. Remaining class time will be used to work on graded assignments or optional text exercises.

Academic Integrity
Consulting with classmates, peers, online GIS resources, and NYU Data Services is encouraged. All graded assignments, however, must be individually produced. It is perfectly acceptable for a classmate to help troubleshoot a difficult task but not acceptable to turn in an assignment using output generated by a classmate. Students are expected to abide by Wagner’s academic code.

Graded Assignments & Attendance Policy
Graded assignments are an opportunity to build a portfolio of professional quality GIS work. Late work will NOT be accepted. Further assignments instructions and grading rubrics will be posted on NYU Classes.

Each assignment is a stand-alone product and specific analyses cannot be resubmitted for multiple assignments. Focusing on a single topic/theme and using the same core datasets for all the assignments is encouraged!

Below is a list of assignments and the attendance policy. Assignment instructions will be posted in advance of each assignment’s due date.

Map Portfolio
25% of course grade
Due 10/10/17 @ 6pm

Spatial Analysis Memo
25% of course grade
Due 11/14/2017 @ 6pm
Research Memo and Presentation

40% of course grade
Presentation due 12/5/2017 @ 5pm; Memo due 12/13/2017 by midnight.

Attendance

10% of course grade
Students are required to attend 12 of the 14 classes. There are no additional excused absences (e.g. being out of town, sick) so be sure to plan accordingly. Students must sign the attendance sheet each class to receive credit.

Course Materials

Software
Students wishing to install GIS software on their personal computers can receive a free educational license of ESRI ArcGIS 10.5 from NYU Data Services. Fill out this form to request a free copy: http://guides.nyu.edu/appointment.

Note: ESRI software only runs on Windows operating systems. Many NYU lab computers are equipped with ArcGIS. If you cannot install ArcGIS on your personal computer, you must plan to use NYU lab computers to complete the assignments and labs outside of class time.

Students MUST use ESRI ArcGIS to complete lab and graded assignments.

Data Storage
Recommended: Bring an external drive or USB flash drive to class (at least 64GB).

Optional Texts

Getting to Know ArcGIS for Desktop, 3rd edition or later, Michael Law and Amy Collins
Mapping It Out, Mark Monmonier

Communication
All course documents will be posted on Google Drive. Links will be provided in Google Classes. There is also a private Slack group for the Fall semester class. See this video for a primer on Slack. Important class messages will be circulated via email.
# Tentative Class Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture Topic</th>
<th>Lab Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/5/2017</td>
<td>Intro to GIS</td>
<td>Explore ArcGIS</td>
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<tr>
<td>9/12/2017</td>
<td>Elements of map making</td>
<td>Reference Maps</td>
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<tr>
<td>9/19/2017</td>
<td>Linking and querying attribute data</td>
<td>Data Management; Map Projection; Thematic Maps</td>
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<tr>
<td>9/26/2017</td>
<td>Symbolizing geographic data</td>
<td>Thematic Maps, Cont.</td>
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<tr>
<td>10/3/2017</td>
<td>Cartographic generalization</td>
<td>Clip, Erase, Feature Types</td>
</tr>
<tr>
<td>10/10/2017</td>
<td>Linking and querying data by location</td>
<td>Overlay Analysis I</td>
</tr>
<tr>
<td>10/17/17</td>
<td>Summarizing attributes across multiple geographic units</td>
<td>Overlay Analysis II</td>
</tr>
<tr>
<td>10/24/2017</td>
<td>Measuring distance</td>
<td>Proximity Analysis</td>
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<tr>
<td>10/31/2017</td>
<td>Site selection</td>
<td>Site Selection</td>
</tr>
<tr>
<td>11/7/2017</td>
<td>Advanced methods preview</td>
<td>Digitizing; KML</td>
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<tr>
<td>11/14/2017</td>
<td>Geocoding</td>
<td>Geocoding</td>
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<tr>
<td>11/21/2017</td>
<td>Raster data</td>
<td>Raster Analysis</td>
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<tr>
<td>11/28/2017</td>
<td>Course wrap up - TBD; optional student presentations</td>
<td>Open Lab</td>
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<tr>
<td>12/5/2017</td>
<td>Class presentations</td>
<td>No Lab</td>
</tr>
<tr>
<td>12/13/2017</td>
<td>No Class: Legislative Day</td>
<td></td>
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**ASSIGNMENT DUE**