ENGRG 59910
Introduction to GIS
Michael Piasecki
August 31, 2018
Lecture 01: Introduction to the Class
Today’s outline:

• Introduction to the course
  • Know each other
  • Course resources
  • Course structure
  • Course Expectations and Grading

Acknowledgement: slide content of lectures in part taken from Youliang Qiu at University of Florida
Instructor: Michael Piasecki

• Research Interests: Hydrology and HydroInformatics

• Office hour: Fridays during lab or after or by appointment

• Email: mpiasecki@ccny.cuny.edu

• Phone: (212) 650 – 8321
Class Website:
Class Website:

City College New York
Department of Civil Engineering
Introduction to GIS – ENGRG 59910

Class Schedule

<table>
<thead>
<tr>
<th>Class</th>
<th>Date</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>08/31</td>
<td>Introduction to Class, Syllabus, Grading, Lab, Expectations</td>
</tr>
<tr>
<td>2</td>
<td>09/07</td>
<td>Chapters 1 &amp; 2 Introduction to GIS, Data Models</td>
</tr>
<tr>
<td>3</td>
<td>09/14</td>
<td>Chapter 3 Map Projections and Coordinate Systems</td>
</tr>
<tr>
<td>4</td>
<td>09/21</td>
<td>Chapters 4 &amp; 7 Maps &amp; GIS Data Sources</td>
</tr>
<tr>
<td>5</td>
<td>09/28</td>
<td>Chapters 8 GIS and Databases Basics</td>
</tr>
<tr>
<td>6</td>
<td>10/05</td>
<td>Chapters 9 Spatial Analysis</td>
</tr>
</tbody>
</table>
Class Website:

City College New York
Department of Civil Engineering
Introduction to GIS – ENGRG 59910

Lab Schedule

<table>
<thead>
<tr>
<th>Lab</th>
<th>Date</th>
<th>Lab Assignment</th>
<th>Problem Set</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>08/31</td>
<td>ESRI Training Module: <a href="#">Getting Started with GIS</a></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>09/07</td>
<td>Chapter 1: Basic Operations</td>
<td>1.2</td>
</tr>
<tr>
<td>3</td>
<td>09/14</td>
<td>Chapter 2: Map Design</td>
<td>2.3</td>
</tr>
<tr>
<td>4</td>
<td>09/21</td>
<td>Chapter 3: GIS Outputs; Lab on Loading Data from various Sources</td>
<td>3.1; 3.3</td>
</tr>
<tr>
<td>5</td>
<td>09/28</td>
<td>Chapter 4: File GeoDatabase</td>
<td>4.2</td>
</tr>
<tr>
<td>6</td>
<td>10/05</td>
<td>Chapter 5: Spatial Data</td>
<td>5.2</td>
</tr>
</tbody>
</table>
Class Website:

Project Related

1. Suggestions for Projects: This is to give you an idea what could be done as a term project.
2. Project Grading: So you know what to look out for and address properly.
3. ArcGIS 10.3 Installation: Follow these instruction to install a one-year free license on your computer

Project Presentation Schedule

<table>
<thead>
<tr>
<th>Students</th>
<th>Day of Presentation</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fri Dec 8</td>
<td>10:05</td>
</tr>
<tr>
<td></td>
<td>&quot;</td>
<td>10:20</td>
</tr>
<tr>
<td></td>
<td>&quot;</td>
<td>10:35</td>
</tr>
<tr>
<td></td>
<td>&quot;</td>
<td>10:50</td>
</tr>
</tbody>
</table>
Class Website:

City College New York  
Department of Civil Engineering  
Introduction to GIS – ENGRG 59910

<table>
<thead>
<tr>
<th>Name</th>
<th>Lab1</th>
<th>Lab2</th>
<th>Lab3</th>
<th>Lab4</th>
<th>Lab5</th>
<th>Lab6</th>
<th>Lab7</th>
<th>Lab8</th>
<th>Lab9</th>
<th>Lab10</th>
<th>Lab11</th>
<th>Lab12</th>
<th>PPT</th>
<th>REP</th>
<th>Final</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Split</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>35 (10.5)</td>
<td>65 (19.5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max Points</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SK</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TW</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Introduce yourself

- Name
- Where are you from?
- What is your major – career objectives?
- **Why do you take this class** – course objectives?
- Do you have GIS experience from before?
- ....
What will you learn?

GIS Theory

Spatial Thinking  ↔  Problem Solving

GIS Technology

Textbook
Lectures
Course Labs
ESRI Labs

Software Independent

Use ESRI Software

- You will use GIS software intensively in the lab sessions but this is NOT a software package tutorial course
- Basic computer skills are necessary
Textbook

Required


Recommended

• “Getting Started with Geographic Information Systems” by Keith C. Clarke. 5th edition.

• “Introduction to Geographic Information Systems”, by Kang-tsung Chang, 3rd or 4th editions.
Course Lectures

• Friday, 10:00am - 11:40am, Steinman 424

• Lecture and Lab attendance is mandatory (15% of your final grade)

• The difficulties of the lectures:
  • GIS theory is abstract => attempt to use visuals rather than equations and complex graphs
  • A lot of information
Overcome Lecture Difficulties

• Reading textbook before lecture

• Using Power Point slides for classroom notes

• Feel free ask any question if you do not understand

• Your feedback, especially “constructive criticism” feedback is the most important source for course improvement
Lab Text

“IGIS Tutorial for ArcGIS 10.3x Basic Workbook 1” by Wilpen Gorr and Kristen Kurland, ESRI Press

This is a workbook compiled by ESRI developers and is the result of many years of instructing. The modules are very clear and quite helpful in getting your hands dirty.
Course Labs

• Friday, 011:00 - 01:00pm

• Labs will take place in ST424

• Work through the sections and exercises and finish up by working on the lab assignment.

• Finish it class and submit electronically.

• If you are done while in Lab, all the better. Otherwise, take home and submit by next week.

• Note: Labs are due prior to next weeks lecture! No exception.
Overcome Lab Difficulties

• Our lab has very good computers!

• The machines have ArcGIS 10.2

• Ready for the time-consuming exercises

• Use the available resources as a guidance — your spatial thinking and problem solving skills are expected and required.
ESRI Virtual Campus Labs

• Provided by software manufacturer

• http://www.esri.com/training/

• Many of the past students enjoy it

• Toward an ESRI train certificate

➢ Do the ESRI modules first
➢ Work together to complete the labs
➢ Try to get the lab done in one sitting
Work from your own computer

• You will get a student version ArcGIS software. There is also a completely free 21 day trial to install in your own computer. With help available at

• Please contact me to receive a license key: mpiasecki@ccny.cuny.edu

• Notice the version differences. The Lab has 10.2, you will get a CD for 10.4. However, this key is valid for versions 10.3 and 10.2 also.

• Details will be given in lab session
Course Evaluation & Grading

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Exam</td>
<td>30%</td>
</tr>
<tr>
<td>Attendance and participation</td>
<td>12%</td>
</tr>
<tr>
<td>Labs</td>
<td>28%</td>
</tr>
<tr>
<td>Final Project</td>
<td>30%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

**Grading Scale (typically on curve, but this is a good guideline)**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>92-100%</td>
</tr>
<tr>
<td>A</td>
<td>89-92%</td>
</tr>
<tr>
<td>A-</td>
<td>86-89%</td>
</tr>
<tr>
<td>B+</td>
<td>86-83%</td>
</tr>
<tr>
<td>B</td>
<td>80-83%</td>
</tr>
<tr>
<td>B-</td>
<td>77-80%</td>
</tr>
<tr>
<td>C+</td>
<td>73-77%</td>
</tr>
<tr>
<td>C</td>
<td>70-77%</td>
</tr>
<tr>
<td>C-</td>
<td>69-73%</td>
</tr>
<tr>
<td>D+</td>
<td>65-69%</td>
</tr>
<tr>
<td>D</td>
<td>60-65%</td>
</tr>
<tr>
<td>F</td>
<td>Less than 60%</td>
</tr>
</tbody>
</table>
Project Topics

• Something related to what you do in your research or lab work

• Check out alternative GIS products; such as MapServer or GeoServer to build collections of layers.

• Use ESRI’s ArcGIS Online system to do develop and publish your work

• There is also the possibility to develop apps ...

• Examine spatial patterns of environmental data, census data, energy data, agricultural data, transportation data, ...

• Develop a new ArcGIS tool, using Python, C#, or visual basic ...

• Many more ...
Project Grading

• I expect a written report on project; professional style
  - 11pt font, Calibri, 1.15 spaced
  - cover page
  - 1-inch margin all around
  - not more than 8 pages!
  - report presentation is 20/100 for project

• The report/project content is a key factor for your grade. I look at
  - complexity,
  - use of GIS,
  - and then a “coolness” factor.
  - content is 65/100 for project

• I expect a PPTx presentation of your project (last day of class)
  - we will use Ignite format (7 minutes with 21 slides on 20sec auto-forward)
  - PPTx presentation will be 35/100 for project
  - for helpful tips on Ignite: http://igniteshow.com/
The Pain-Gain Raster

Finals Question:
In the following GIS pain-gain raster layer, choose a cell and insert a digit “1”, and only one “1”, and all others to Null to reflect your GIS learning experience in this course. For example, if you think your experience is “high pain” and “low gain”, fill in “1” in the bottom-left cell. Every student will have one raster layer. What kind of a simple GIS analysis operation that I can run in Raster Calculator to get the all students’ experience?
How did students respond?

![A chart showing the responses of students to pain and gain.

- Pain:
  - 0: 0
  - 9: 0
  - 12: 0

- Gain:
  - 0: 4
  - 9: 5
  - 12: 0]
Others Things

• Late assignment
  -> will be met with 10%/day reduction of grade

• Attendance
  -> will be taken in all lectures and labs

• Academic Integrity Policy (no claiming “Oh I did not know that”)
  -> work on your own for labs and projects!
  -> [http://www.cuny.edu/about/administration/offices/la/Academic_Integrity_Policy.pdf](http://www.cuny.edu/about/administration/offices/la/Academic_Integrity_Policy.pdf)

• Lab room access: will be provided
What I expect from you?

• Work 4-8 hours per week

• Study GIS with good attitude

• Always ask questions when encountering a problem
Drop or not?

• **Keep it** if you want to get some GIS experience

• **Keep it** if you want to find a job in GIS

• **Keep it** if you want to use GIS in your research *(but consider to drop it because this course will distract you from other research)*

• **You may drop it** if you take this course by required *(choose an alternative course)*

• **You must drop it** if you do not want to get an A

• **You must drop it** if you want to get an easy A