

Course Syllabus

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Columbia University – Spring 2017

GIS for Preservation (A6414)

202 Fayerweather – Wednesday 6pm to 8pm

Instructor: Jennifer Most (jlm2053@columbia.edu)

Part-Time TA: Adam Lubitz (asl2192@columbia.edu)

INTRODUCTION

A geographic information system (GIS) is more than just a tool for making maps. GIS is a tool that allows you to integrate geography with data, in order to view, manage, and analyze information about the places you want to study. GIS is a central instrument in a number of fields, including urban planning, public health, environmental science, and now also historic preservation – where it has become an essential for telling stories, analyzing the past, and managing historic resources. In this class, we will learn the basics of the popular GIS mapping program ArcMap, with a specific emphasis on applying those skills to the practice of historic preservation.

CLASS STRUCTURE

This course will meet once a week for two hours. The majority of each class will be dedicated to instruction of GIS by means of hands-on in-class exercises led by the instructor. There will also be lectures and discussions of reading assignments throughout the semester.

ASSIGNMENTS

In-class lessons will be reinforced by weekly at-home assignments and occasional written assignments. There will be one take-home midterm exam and a final project (presentation and paper).

TEXTBOOKS & READINGS

Textbooks: In lieu of a textbook, there will be weekly handouts to accompany each lesson. The handouts are largely derived from these three sources:

- *GIS Tutorial 1: Basic Workbook for ArcGIS 10* (Wilpen L. Gorr and Kristen S. Kurland, 2011)
- *Getting to Know ArcGIS Desktop, Second Edition, Updated for ArcGIS 10* (Tim Orms, Eileen J. Napoleon, Robert Burke, Carolyn Groessl, and Laura Bowden, 2010)
- *The GIS 20: Essential Skills* (Gina Clemmer, 2010).

Readings: Readings for this class mostly come from the following books:

- *Past Time, Past Place: GIS for History* (Anne Kelly Knowles, 2002)
- *GIS for the Urban Environment* (Juliana Maantay and John Ziegler, 2006)

Readings will be made available through Courseworks, though you may want to consider purchasing the books for future references. The books are also available at Avery Library.

EXTERNAL HARD DRIVE OR FLASH DRIVE

It is **required** that everyone get an **external hard drive** or **flash drive** for use in this class. The external hard drive or flash drive will be used for copying data from the class drive and will enable you to work seamlessly on any computer that runs ArcMap. If you already have an external hard drive or flash drive that you would like to use, I recommend a **minimum of a 40 GB** of free space. *The external hard drive or thumb drive must be brought with you to every class, starting on day one (January 18th, 2017).*

GRADING:

49 pts – On-Your-Own Assignments (8 in total, 4-8 pts each, see handouts)

6 pts – Group Presentations, *Past Time, Past Place*

12 pts – Midterm Exam

28 pts – Final Project (Proposal – 3 pts; Paper – 15 pts; Presentation – 10 pts)

5 pts – Class Participation & Preparation

100 pts (100%) + Optional Extra Credit Assignment – 2 pts

On-Your-Own Assignments

See handouts for each of the 8 “on-your-own” assignments, weekly up to week 6. All instructions, including what to hand in and what to upload to Courseworks, are noted on the handouts.

All assignments must be printed in **color, stapled** and handed in **prior** to the start of class on the day the assignment is due.

Pay attention to instructions and make sure you hand in all required deliverables. Pointswill be deducted for unexcused lateness or incomplete assignments.

Midterm Exam

The midterm exam will be a take-home exam which tests your understanding of the **lectures, readings, and techniques** learned in the first half of the semester.

Final Project

Your final project should relate in some way to the field of historic preservation. You can create or collect your own data with the goal of answering a research question using ArcGIS. This project is purposefully broad to allow you to work on a subject that interests you. I recommend thinking about possible projects as soon as possible.

Week 9 (March 22nd) will be an opportunity to speak with the professor in class about developing your idea.

Final project proposals are due *March 29th*. **Final presentations** will be divided into two sessions, *April 19th* and *April 26th*. Printed copies, in **color and stapled**, of both your **final papers** and **final presentations** must be handed in by the earlier session on *April 19th* in order to ensure fairness to all.

GETTING HELP

Electronic Data Services (EDS): EDS, located in the basement of Lehman Library, is a great resource for GIS data and technical questions. EDS collects GIS data that you can use for your final projects or other GIS work. They also provide technical consultations for acquiring data and also for using ArcGIS.

ESRI User Forums: There are two ESRI websites that are great resources for technical GIS software questions - the old and new user forums: <http://forums.esri.com/search.asp?c=93> (Links to an external site.)Links to an external site. (old forum) and <http://forums.arcgis.com> (Links to an external site.)Links to an external site. (new forum).

Computer Hardware, Network, or Software Problems: The instructor and your TA are not equipped to assist with computer hardware, network, or software problems. If you are having any such trouble, it is strongly recommended that you reach out to the **GSAPP helpdesk** and open a helpdesk ticket. Opening a ticket is essential for tracking progress of your issue, and can be helpful documentation if something catastrophic happens to prevent you from completing an assignment on time. To open a ticket, go to: <https://www.arch.columbia.edu/help>.

Office Hours: Your instructor is available for assistance as needed, though I am generally not available between 8am and 6pm on weekdays, which means that responses to email questions may be slow during these hours. For this reason, I strongly encourage you to start assignments early. The Studio II TA.... for more timely responses.

****NOTE: CONTENT IS SUBJECT TO CHANGE.****

WEEKLY SCHEDULE

Week 1

Wednesday, January 18th

Lecture: Introduction to GIS Mapping & Mapping for Preservation

In-Class Exercise: Getting familiar with ArcMap (ArcMap Tools, Scaling your Map, Identifying Features, Saving MXDs, Adding & Using Map Layers, Changing Symbology, Saving Layers (.lyr), Auto-Labeling, Exporting to PDF or JPG)

On-Your-Own Assignment 1: due Wednesday, January 25th

Week 2

Wednesday, January 25th

Lecture: Collecting & Assessing Data for GIS

In-Class Exercise: Starting a New Map, Managing GIS Files, and Working with Existing GIS Data (Using ArcCatalog, Adding Data, Selecting Features, Querying Data, Working with Attributes - Selecting by Attributes/by Location, Creating New Layers, Creating a Layout & Labeling)

On-Your-Own Assignment 2: due Wednesday, February 1st

Week 3

Wednesday, February 1st

Lecture: Qualitative and Quantitative Maps, Classifying Data

In-Class Exercise: Creating Thematic Maps (Classifying Data)

On-Your-Own Assignment 3: due Wednesday, February 10th

Reading: Basic GIS Methods of Analysis and Software Functionality – Chapter 1 (pgs 29-45) – *Mapping Global Cities* (Ayse Pamuk), answer question on OYO 3 handout, due Wednesday, February 8th

Week 4

Wednesday, February 8th

Lecture: Map Projections and Coordinate Systems

In-Class Exercise: Modifying Attribute Tables, Joining and Editing GIS Data (by Attributes & Spatially), Creating Centroids from Polygons

On-Your-Own Assignment 4: due Wednesday, February 15th

Week 5

Wednesday, February 15th

Lecture: Map Design

In-Class Exercise: Editing Metadata, Downloading Data, Prepping an Excel Spreadsheet for Joining and Joining U.S. Census Data

On-Your-Own Assignment 5: due Wednesday, February 22nd

Reading: “Make Maps People Want to Look At,” by Aileen Buckley for ArcUser (Winter 2012)

Week 6

Wednesday, February 22nd

Lecture: Creating and Editing Shapefiles

In-Class Exercise: Editing Vector Data (Points, Polygons & Lines)

On-Your-Own Assignment 6: due Wednesday, March 1st

Group Presentations (based on Readings from *Past Time, Past Place*): due Wednesday, March 1st

Week 7

Wednesday, March 1st

Mini Presentations: Review of *Past Time, Past Place* Readings by Students

If there's time remaining, we'll also do a question and answers session for skills learned weeks 1-7

On-Your-Own Assignment 7: due Wednesday, March 8th

****Note: Come next week prepared with questions re: your final projects and the midterm.*****

Week 8

Wednesday, March 8th

Lecture: Map Projections & Georeferencing

In-Class Exercise: Map Projections, Georeferencing Historic Maps and other Raster Images

Discussion: Midterm Exam and Final Project Discussion

Assignments (note due dates below!):

- 1) Take-Home Midterm Exam: Testing your knowledge of the GIS concepts and techniques discussed during lectures and in-class exercises - *due March 22nd*
- 2) Draft Final Project Proposal: Draft a final project proposal and hand in alongside your midterm. I will email you comments during the following week. You will then have a chance to revise your proposal and discuss with me and your TA next week. Deliverable: No more than one single-sided page – *due March 22nd*
- 3) Optional: Download the tracking app **OpenPaths** to your smart phone, and allow the program to run on your phone for any length of time between now and Week 11, at which point you will be able to use the data collected for an Extra Credit assignment – *due April 12th*

****Be prepared to discuss and begin working on your final projects during the next class.****

SPRING BREAK – NO CLASS MARCH 15th

Week 9

Wednesday, March 22nd

Final Project Discussions and Development / In-Class Working Session

Assignment (due next class):

- 1) Final Project Proposal: Based on the in-class discussions, refine your final project proposal and resubmit next week. Deliverable: No more than one single-sided page (printed) – *due March 29th*

Week 10

Wednesday, March 29th

In-Class Exercise: Geoprocessing Techniques (Merging, Appending, Clipping, Dissolving, Intersections, Buffering, and Spatial Joining)

On-Your-Own Assignment 8: due Wednesday, April 5th

Week 11

Wednesday, April 5th

Guest Lecture: Guest Lecture: Web Mapping

In-Class Exercise: Web Mapping / KML Files and ArcMap

Assignments (due next class):

- 1) Extra Credit. See handout – *due April 12th*

Week 12

Wednesday, April 12th

Lecture: Final Project Pointers and Reminders

In-Class-Exercise: Digital Photos as GPS / Hyperlinking in ArcMap / Map Animations / 3D GIS

Assignments (due next class):

- 1) **FINAL PRESENTATIONS AND PAPERS DUE NEXT WEEK FOR**

EVERYONE! Please make sure to print in full-color (and staple!) your final papers and presentations, to be handed in at the beginning of next class (regardless of which day

you present). *Remember, all work presented must match what you handed in or points will be deducted.*

Week 13

Wednesday, April 19th

Final Presentations, Round 1

Week 14

Wednesday, April 26th

Final Presentations, Round 2

Course Summary:

Date	Details	
Wed Jan 25, 2017	On-Your-Own Exercise 1 (5 points) (due January 25, 2017)	due by 5:55pm
Wed Feb 1, 2017	On-Your-Own Exercise 2 (6 points) (due February 1, 2017)	due by 5:55pm
Wed Feb 8, 2017	On-Your-Own Exercise 3 (8 points) (due February 8, 2017)	due by 5:55pm
Wed Feb 15, 2017	On-Your-Own Exercise 4 (6 points) (due February 15, 2017)	due by 6pm
Wed Feb 22, 2017	On-Your-Own Exercise 5 (8 points) (due February 22, 2017)	due by 5:55pm
Wed Mar 1, 2017	On-Your-Own Exercise 6 (6 points) (due March 1, 2017) - Same day as Group Presentations	due by 6pm
Wed Mar 8, 2017	On-Your-Own Assignment 7 (4 points) (due March 8, 2017)	due by 5:55pm
Wed Mar 22, 2017	Midterm Exam (12 points) (due March 22, 2017)	due by 6pm

Date	Details	
Wed Mar 29, 2017	Final Projects - Proposals (3 Points) (prepare for Mar. 22, 2017, revise by Mar. 29, 2017)	due by 6pm
Wed Apr 5, 2017	On-Your-Own Assignment 10 (6 points) (due April 5, 2017)	due by 6pm
Wed Apr 12, 2017	Extra Credit Assignment (Week 11) (2 points) (due 4/12/2017)	due by 6pm
Wed Apr 19, 2017	Final Projects, Papers and Presentations (25 Points) (presentations due April 19; papers due April 26)	due by 6pm
	Final Paper Repository	