

MUSA Capstone: Advanced Topics in GIS

Course Syllabus

Details

Instructor: Jonathan Tannen, jonathan.tannen@gmail.com

When and Where: Fridays, 8:30am - 11:30am

Description

This course offers an opportunity to work closely with faculty, staff, classmates, and/or local practitioners on independent projects involving the development and/or application of geographic information systems (GIS).

The course is organized as a seminar: a series of weekly meetings and concurrent assignments that ultimately lead to the implementation and presentation of student-initiated projects. Early in the semester, each student selects a term project dealing with one particular topic in the field of GIS, broadly defined. Topics may range from the basic development of geospatial tools and techniques to practical applications in any of a variety of fields.

Class time will be a combination of structured collaboration, external speakers, and (possibly) lectures on relevant content.

Project Description

The requirements for the final project are intentionally broad, as students are expected to develop one that suits their interests.

Possible project formats include: - A research paper with GIS analysis about a substantive question. - A research paper about GIS or spatial methodology. - Construction of a GIS tool. - A dashboard *answering a question*. (The dashboard cannot simply be a view of the data. It must be targeted towards a novel question.)

For all projects, a complete set of data, scripts, and reports must be provided via GitHub or Google Drive. This should include the raw data, and all processing and analysis.

Students will present on their projects in the final two sessions of the class.

Project Timeline

This calendar is tentative. We will revisit it as we continue the semester.

| Date | Assignment Due | Class Time |
|--------|-------------------------------|--|
| Jan 14 | Initial Topic Brainstorm | Introduction, Syllabus, Share Topics, Turnout Tracker Presentation |
| Jan 21 | Project Proposal 0 | Share Project Proposal, Better Engineering: Github |
| Jan 28 | GitHub Repo with initial data | Fay Walker Speaking, Better Engineering: File Organization |
| Feb 4 | Data Summary Analysis | Proposal & Data Summary Presentations A |
| Feb 11 | | Better Engineering: System Modularity, Proposal & Data Summary Presentations B |

| Date | Assignment Due | Class Time |
|----------|--------------------------------------|---------------------------------|
| Feb 18 | | |
| Feb 25 | Mid-point Work In Progress | Mid-point Presentations A |
| March 4 | Feedback for 2 peer projects | Mid-point Presentations B |
| March 11 | <i>Spring Break</i> | |
| March 18 | | Better Engineering: Code Review |
| March 25 | Peer Code Review | |
| April 1 | | |
| April 8 | | |
| April 15 | Final Presentation (1) | |
| April 22 | Final Presentation (2) | |
| April 29 | <i>No Class</i> , Final Projects due | |

Office Hours

Office hours will be by appointment. They can be in person or by video chat.

Wednesdays from 6pm - 8pm link forthcoming

Grading

Final Project: 50%

Final Presentation: 25%

Class Participation & Preparation: 25%

Assignments

Assignments must be submitted by the time the class meets.

01-14 Initial Topic Brainstorm: One-page document summarizing - your topic

- an open question in the topic to research
- format of your final deliverable
- possible data sources

These will be considered tentative. The goal is to get you to start brainstorming.

01-21 Project Proposal 0: Two-page (or less) document with

- the question you will be answering
- datasets identified
- (brief) summary of existing relevant research
- high-level summary of methods and outputs

01-28 GitHub Repo: Share a GitHub repo for your project, with

- Raw data in a `raw_data/` directory.
- Any scripts, files, or cleaned data.
- A README file in the top directory.

02-04 Data Summary Analysis: An exploratory descriptive analysis of your dataset(s). Include summary statistics and visualizations that speak to your research question. All relevant code and files should be in your GitHub repo.

02-11 Project Proposal 1: An update of Project Proposal 0, with motivating data summary. This may just be a concatenated version of your Proposal 0 and Data Analysis, but your question and deliverable may have changed.

02-25 Work in Progress Report: A draft of your project, to be presented in class and reviewed by two peers. Provide as much analysis as you can, to be able to get proper feedback.

03-04 Peer Feedback: Peer review of two projects. Review goals include: Project design, implementation review, extension ideas.

03-25 Code Review: Code/implementation review of one peer project. We will discuss this in class.

04-29 Final Project