

# CLS-0125 Introduction to Geospatial Humanities

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Spring 2024 • Tufts University

Cross-listed with HIST-0179, FAH-0092, ARCH-0175, UEP-0103

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| Term               | Spring 2024   |
| Day/Time:          | Tuesdays, 6:30-9pm  |
| Location:          | Data Lab, Tisch Library   |
| Course Instructor: | Ian Spangler  |
| Teaching assistant | Max O'Reilly  |
| Office hours:      | Thursdays, 1-3pm or by appointment on Zoom (Ian); Mondays, 12-1pm and Wednesdays, 1-2pm (Max) |

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## Course summary

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The humanities are becoming spatial, or maybe we are finally realizing that they always have been. Geography – the stuff of "where," which encompasses material as concrete as the dirt on the earth to concepts as ephemeral as "space" and "belonging" – informs not only how texts, maps, and other objects are produced, but how we encounter them as readers and users. In recent years, improvements in computing technology and advancements in publicly-accessibly digital archives have harmonized with interest among researchers to conjure a nascent field of study focused on the derivation and analysis of structured geographic data from books, letters, paintings, and much more. This semester, we will explore this field of *geospatial humanities*, learning its techniques, studying its objects, and testing its limits. The course introduces geospatial theory, methods, and technology for applications in the humanities in past and present settings. We'll sometimes use the term "GIS" (short for **geographic information systems**) to describe these geospatial tools. Typically, GIS is defined as a combination of software, data, methods, and hardware with capabilities for manipulating, analyzing, and displaying spatial data. We'll explore spatial data structures, data creation, basic geodesy, spatial analysis, cartographic visualization, and more. Using the software ArcGIS Pro, you will learn how to use these tools effectively. Just as importantly, by incorporating insights from critical archival studies, indigenous and decolonial mapping, feminist geography, and more into your mapping practice, you will learn how to use them *intentionally*.

## Learning objectives & practical skills

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### Learning objectives

Students will learn to use GIS to answer humanistically-informed spatial questions. Detailed labs apply concepts presented in the lectures using a variety of geospatial software in the ArcGIS ecosystem (as well as basic data wrangling literacy in tools like Microsoft Excel). Assignments concentrate on creative applications of concepts covered in lectures and exercises, including a final project in which students independently explore a topic from their own field of interest.

Major learning objectives include:

- The coherence (or not) of geospatial humanities as a field
- Maps, mapping, and cartography as power-laden processes
- Methods and best practices for interacting with (digital) archives
- Spatial data structures, georeferencing, and geoprocessing
- "x" GIS, including critical, queer, decolonial, feminist, and anti-racist approaches to digital maps & mapping
- Technical skills for problem solving in the context of spatial data
- Approaches and applications of GIS across the humanities
- Basic concepts in spatial databases and queries
- Principles of cartographic design (and when to deviate from them)
- The limits of representation and analysis in GIS
- The limits of GIS itself

### Practical skills

More concretely, by the end of this course, students will be able to do the following:

- Identify data structures in spatial data (rasters or vectors)

- Identify, locate, and acquire spatial data pertinent to projects in their field of interest, as well as pinpoint significant gaps in or problems with existing information
- Evaluate the appropriateness of the existing data sources for use in a given application
- Evaluate spatial (meta)data as simultaneously effects and producers of particular kinds of power geometry
- Understand the data creation process and create historical spatial data sets derived from maps, gazetteers, aerial photography, texts, etc.
- Create spatial data from tabular or textual information that includes a spatial reference
- Describe, design, and use basic spatial databases such as the ArcGIS Pro Catalog (using keys, joins and queries)
- Use appropriate spatial analysis methods for raster and vector data, both independently and combined
- Create high-quality maps and associated graphics/visualizations with text that clearly communicate spatial information and the results of analysis
- Design an independent project that incorporates spatial analysis methods
- Appraise spatial analysis in journal articles
- Evaluate and select appropriate map projection and coordinate system
- Use ArcGIS Pro software with strong proficiency

# Grading

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Grading will be based on a **1000-point scale**. You can submit graded activities, labs, assignments up to one week late. By default, all late work will receive a 10% deduction. Details regarding all course assignments, including requirements for the final project and instructions for curations, will be made available on Canvas.

- Several **labs** (4 graded) worth a total of 250 points (50 each)
- 4 skill-building **assignments** worth a total of 400 points (100 each)
- Class participation worth 100 points, including in-class and take-home **activities**
- The **final project** poster or StoryMap worth 250 points
- A **curatorial introduction** on a digital geohumanities project, process, or product, worth 100 points and presented in small groups

| Type          | Quantity | Points per activity | Percentage of overall grade per activity |
|---------------|----------|---------------------|--|
| Labs          | 4        | 50                  | 5%                                       |
| Assignments   | 4        | 75                  | 7.5%                                     |
| Participation | n/a      | 150                 | 15%                                      |
| Final Project | n/a      | 250                 | 25%                                      |
| Curation      | 1        | 100                 | 10%                                      |

# Course Details

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Beyond just showing up to class and paying attention during the lectures, students will develop a geospatial humanities skill set by completing various [activities](#), [exercises](#), and [labs](#), including a [group curation](#). This skill set culminates in a [final project](#) on a topic of their choosing.

## Activities

Nearly every week, we will spend time during class on some kind of **activity**. Some are bigger and some are smaller. Some are submitted and some are not. Overall, they count towards your participation grade.

## Labs

Throughout the semester, students will be assigned five **labs** which explore theories, concepts, and approaches in greater depth. I will drop your lowest Exercise grade at the end of the semester. Each lab weaves together methods and concepts, using them in a software application (usually ArcGIS Pro), and application to a particular area of the humanities.

## Assignments

**Assignments** concentrate on self-directed application of concepts explored in lectures and exercises. Eventually, you will use labs to focus on how geospatial humanities intersect with your own interests, building toward a final project that applies geospatial humanities methods to a topic of your choosing.

## Curation

Before the end of the semester, you and 2-3 peers will work together on a **curation** – a deep dive into a geospatial humanities project, process, or product – presenting your findings to the class in roughly 10 minutes. Instructions forthcoming.

## Final Project

Beginning in Week 8, you will begin work towards a final project. The final project is an opportunity to collect, process, analyze, and visualize spatial data of your own choosing. Using ArcGIS Pro, you'll choose a topic and elaborate it in three registers: its *conceptual register*, its *technical register*, and its *graphical register*. The final product will result in a **large-format infographic (poster) or an online interactive StoryMap** that describes the research question, data, and methods as well as the analysis and the results. Examples of similar student projects can be found at [Tufts GIS Expo Explorer](#).

Students may choose to exhibit their work at Tufts' GIS Expo day on May 8 for 25 points (2.5% of overall grade) of extra credit.

## Required Readings

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You'll have something to read just about every week: this is, after all, a "humanities" course just as well as a "geospatial" one. All readings are listed in the [schedule](#), and they are available through online journal databases open to Tufts students, public web sites, or Canvas.

## Style Guidelines & Citation

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All **cartographic work** should adhere, when appropriate, to key principles of map design.

All **written work** should be consistent with the style guidelines of one of the [major style guides](#). I have no preference for which one you choose – Chicago, MLA, and APA are all fine – but whatever you select must be applied consistently in your work.

To manage your readings and notes, I recommend downloading [Zotero](#). It is a free, highly customizable software that allows you to take notes, produce standardized bibliographies, and store readings in a single interface. Tufts provides a [guide](#) for getting started. Zotero will make your life easier far beyond this class, and the earlier you start using it, the better.

By week 4 of the course, if you have...

- Installed [Zotero](#)
- Installed the [Zotero Connector plugin](#)
- Registered for a Zotero account through Tufts
- Loaded some of our course readings into Zotero

... I will give you 10 points (1% of your overall grade).

## Accommodations for Students with Disabilities

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Tufts University values the diversity of our body of students, staff, and faculty and recognizes the important contribution each student makes to our unique community. Tufts is committed to providing equal access and support to all qualified students through the provision of reasonable accommodations so that each student may fully participate in the Tufts experience. If a student has a disability that requires reasonable accommodations, they should please contact the StAAR Center (formerly Student Accessibility Services) at [StaarCenter@tufts.edu](mailto:StaarCenter@tufts.edu) or 617-627-4539 to make an appointment with an accessibility representative to determine appropriate accommodations. Please be aware that accommodations cannot be enacted retroactively, making timeliness a critical aspect for their provision.

## Schedule

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Our semester breaks down into three "Parts." During **Part I** (weeks 1-4), we'll pick up the fundamentals of geospatial humanities. During **Part II** (weeks 5-9), the rubber meets the road as we experiment with various technical and analytical approaches to "doing" the geospatial humanities. During **Part III** (weeks 10-15), we pivot towards applying these approaches to specific areas of study, including your own. Both the schedule and its weekly themes are subject to change.

While this is not imperative, I recommend trying, to the extent that you are able, to complete course assignments **in the order that they are listed under the "Due before class" bullet**.

### Part I: Fundamentals

**January 23 • Introductions • What is our subject?**

*Week 1: Defining "geospatial humanities"; critical cartography; kinds of maps; "x" GIS; mapping with purpose.*

- What are the "geospatial humanities?" What are its constitutive objects, and why are you interested in them? What defines a "humanistic" approach to geographic information systems and spatial data? How ought we approach these questions from a technical perspective?
- First day of class! Nothing due...

## January 30 • Distortion • Squashing globes and bending lines

*Week 2: Geographic and projected coordinate systems; scale; projecting XY data; tile pyramids.*

- How do we go about displaying round earth as a flat map? What are the basic mathematical and geodetic rules associated with this process? What sacrifices do we have to make in order to "flatten" the globe, and how have those sacrifices been used strategically?
- Due before class:
  - Lab 01: [Learning ArcGIS Pro Basics](#)
  - "[Squashing the globe](#)," *Bending Lines: Maps and Data from Distortion to Deception*. 2020.

## February 6 • Data • Cartographic ethics

*Week 3: Evaluating data & sources; data classification; understanding vector & raster models; situated knowledge & strong objectivity; querying; logical operators; sample curation.*

- What is spatial data and what are spatial data models? Where does spatial data come from? How should you understand data in their social context? What ethical considerations should guide how we represent data cartographically?
- Due before class:
  - Activity 01: [Mapping ancient places](#)
  - Bouie, Jamelle. 2022. "[We Still Can't See American Slavery for What It Was](#)." *The New York Times*, January 28, 2022, sec. Opinion.
  - RECOMMENDED: Skim through McKittrick, Katherine. 2014. "[Mathematics Black Life](#)." *The Black Scholar* 44 (2): 16–28.

## February 13 • Design I • Aesthetics & politics in mapping

*Week 4: Basic color theory; choropleth mapping; layer blending; text on maps; basemaps.*

- What are the best practices for representing spatial data and making maps? To what extent are those practices contingent on flexible cultural and social norms? When should you bend or break these rules in order to make a more effective argument? Is cartography an "art," a "science," something in between, or neither? Is cartography anything at all?
- Due before class:
  - Curation Group 1
  - Lab 02: [The Transatlantic Slave Trade Database](#)
  - Listen to Bose, Tulika. 2023. "[The Surprising Backstory behind Witch Hunts and Reproductive Labor](#)." *Scientific American*.

## Part II: Approaches

### February 20 • Archives I • Contingencies of counting people

*Week 5: Census data; table joins; (limitations of) the census; the modifiable areal unit problem.*

- Why do we count people? Where does the device of a "census" come from? Who gets counted and who doesn't? How can we map those presences and absences?
- Due before class:
  - Assignment 01: [WITCHCRAFT!](#)
  - Activity 02: [Population Change in Africa, 1850-1950](#)
  - Jacobs, Alexandra. 2022. "[Counting the Population Has Always Been Political](#)," *The New York Times*, 2022.
  - Loftus, Eve and Joan Brunetta. 2024. "[Mapping Black Cambridge](#)," *Leventhal Map & Education Center*.

## February 27 • Analysis I • Spatial research questions

*Week 6: Spatial joins; vector proximity analysis; layer blending; field calculation; boolean logic; bivariate maps; ArcGIS online.*

- How do we proceed from representation to analysis? What kinds of spatial research questions can we ask and answer using GIS? How do different spatial data structures permit and constrain different forms of spatial analysis?
- Due before class:
  - Curation Group 2
  - Activity 03: [Historical census](#)

## March 5 • Archives II • Breathing new life into old maps

*Week 7: Raster data structure; digitization; georeferencing; feature extraction; reprojecting maps & data.*

- How do you turn scanned maps into spatial data? Once you have, what should you do with that spatial data?
- Due before class:
  - Lab 03: [Lighthouses, shipwrecks, and the architecture of maritime empire](#)
    - OPTIONAL PAIRING: Watch [The Lighthouse \(2019\)](#)
  - Lumiere Brothers, dir. 1895. (MediaFilmProfessor, 2011.) [1895, Lumiere, Workers Leaving the Lumiere Factory](#).
  - Wilson, Andrew Norman, dir. 2011. [Workers Leaving the Googleplex](#).
  - RECOMMENDED: Goldsmith, Kenneth. 2013. "[The Artful Accidents of Google Books](#)." *The New Yorker*, December 4, 2013.
  - RECOMMENDED: Somers, James. 2017. "[Torching the Modern-Day Library of Alexandria](#)." *The Atlantic*, April 20, 2017.

## March 12 • Analysis II • Pixelated places

*Week 8: (Re)sampling; raster analysis; map algebra; spatial statistics; kernel density; vector-raster transformations; cost-path analysis; interpolation; spatial databases.*

- What analytical opportunities does representing spatial information as raster data instead of vector data create? What are the basic mathematical and statistical foundations of raster analysis? What are its structures, functions, and limits?
- Due before class:
  - Curation Group 3

- Assignment 02: [Old maps, new stories](#)

## March 19 • Mandatory relaxation • Spring break

Week 9: No class

## Part III: Applications

### March 26 • Archives III • Text

Week 10: Natural language processing (NLP); applied historical gazetteers; machines reading maps.

- What are best practices for applying geospatial methods to texts?
- Due before class:
  - Curation Group 4
  - Lab 04: [Pixelated places](#)
  - Activity 04: [Final project topic proposal](#)

### April 2 • Analysis III • Archaeology

Week 11: Map algebra; zonal statistics; cost-path analysis; suitability analysis; deriving raster from vector and vice versa.

- How can geospatial methods be applied to archaeological inquiry?
- Due before class:
  - Curation Group 5
  - Assignment 03: [NLP for GIS](#)

### April 9 • Design II • Libraries & letters

Week 12: Flow mapping; advanced cartographic design; icons and iconography.

- How can we apply methods of geospatial inquiry to large corpuses of text, such as letters?
- Due before class:
  - Lab 05: [Archaeology](#)
  - Activity 05: [Final project environmental scan & wireframe](#)
  - Edelstein, Dan et al. 2017. "[Historical Research in a Digital Age: Reflections from the Mapping the Republic of Letters Project](#)." *The American Historical Review* 122 (2): 400–424.

### April 16 • Flex day • TBD

Week 13: 🍷 🍷 🍷

- We'll leave some flex space in the syllabus for exploring topics of particular interest to students in the course. This could include further exploration of a particular methods or technical workflow, deeper dives into geospatial theory or geohumanities concepts, wrangling specific datasets... or simply extra office hours for your final projects. We'll fill this flex day in before spring break.
- Due before class:
  - Activity 06: [Flowing letters](#)

### April 23 • Beyond • Whither "GIS?"



*Week 14: Maps and mapping "beyond" GIS; inductive visualization.*

- What techniques exist for humanistic engagement with geospatial data outside the boundary of "GIS"?
- Due before class:
  - Curation group 8
  - Assignment 04: [Final project draft map](#)
  - Knowles, Anne Kelly, Levi Westerveld, and Laura Strom. 2015. "[Inductive Visualization: A Humanistic Alternative to GIS.](#)" *GeoHumanities* 1 (2): 233–65.

#### **April 30 • Presentations • Final projects**

*Week 15: Last in-person meeting; final project lightning talks; reflection.*

- Presentations on final project topics in 5 minutes or less. Share works in progress, provisional maps, harebrained ideas. Slide deck optional.
- Due before class:
  - Activity 07: [Reflection](#)

#### **May 7 • Final project due**

*Finals week: Submit final project on Canvas by 11:59pm on Tuesday, May 7.*

#### **May 8 • GIS Expo**

*Finals week: Optionally attend the GIS Expo for 10 points extra credit (1% of overall grade) or exhibit your work for 25 points extra credit (2.5% overall grade).*