University of Pennsylvania - Arts & Sciences | Department of Earth & Environmental Science
ENVS 3700 GIS: Mapping Places & Analyzing Spaces
Section 001, CRN 29114
Course Syllabus - Spring 2025
Course Credit: 1

Instruction Method: In Class
Location: Thursday 1:45pm-4:44pm in PCPE 201 (1/15 to 4/30)
Instructor: Thomas McKeon, MPH
https://orcid.org/0000-0002-2999-9175
Office Hours (By appointment):
e-mail: mckeont@pennmedicine.upenn.edu

Course Description

This course is a hands-on introduction to the concepts and capabilities of geographic information systems (GIS). Students will develop the skills necessary for carrying out basic GIS projects and for advanced GIS coursework. The class will focus on a broad range of functional and practical applications, ranging from environmental science and planning to land use history, social demography, and public health. By the end of the course, students will be able to find, organize, map, and analyze data using both vector (i.e. drawing-based) and raster (i.e. image-based) GIS tools, while developing an appreciation for basic cartographic principles relating to map presentation. This course fulfills the spatial analysis requirement for ENVS and EASC Majors. Previous experience in the use of GIS is not required.

Teaching Methods

The majority of classes will feature a didactic lecture followed by an interactive session using ArcGIS Pro. Several classes will also include group activities. Our weekly classes will be held in person unless there is a circumstance where I am quarantining or traveling. In those instances, I will either find a substitute instructor for our live session or we will meet virtually as a class when possible. In these situations, I will let you know as soon as possible to try to avoid unnecessary travel for you. I will post announcements via Canvas. If you are unable to attend class, you will have access to class slides and activities posted on Canvas after class, and you can rely on your group members, course staff, and office hours to improve your understanding.

Learning Goals

1. Understand how spatial data are encoded in GIS

2. Acquire, generate, and integrate spatial data

3. Create maps and related graphics

4. Design and execute GIS analyses

5. Report and interpret GIS analyses

Course Materials

The recommended textbook for this course is *GIS Fundamentals: A First Text on Geographic Information Systems, Seventh Edition* (2022) by Paul Bolstad and Steven Manson, published by Eider Press. The book is a supplemental resource for the course, and I highly recommend obtaining a copy to support your learning. Several options are available for accessing the book: **VitalSourceLinks to an external site.** or **RedShelfLinks to an external site.**. The print version is available from **Baker & Taylor Publishing**. Links to an external site.

I will provide supplementary materials, relevant sections, and references to key concepts in Canvas. The textbook is not required however having access to the full text will ensure you can delve deeper into the material and learn more from this course. Other readings may be assigned on an ad hoc basis.

Technology Course Requirements and Recommendations

The course is held in a classroom with computers installed with the required ArcGIS Pro software. Although you will have time to work on assignments in the classroom, you should find a way to work on assignments either at the library or on your personal laptop / Desktop computer. There are two options for accessing ArcGIS on your personal device.

1. Use Penn's SAS vLab (virtual lab) to remote access a PC that has ArcGIS installed. Instructions are here: https://computing.sas.upenn.edu/remote-teaching/vlab-connect

2. Download ArcGIS Pro to your laptop/ Desktop computer. This works well on a Windows machine. MAC users may need to create a virtual Windows environment. Note that for this option, you will need an ArcGIS account login. Even if you do not plan to download ArcGIS, I recommend making an online account as it provides access to online materials. If you have trouble with this, let me know or email Girmaye Misgna (gmisgna@upenn.edu) and he will help set up your account. Steps to install your own copy in a Windows environment

   Go to ArcGIS online: https://www.arcgis.com/index.html#

   Sign-in using the Organization URL option:
   A. The URL is upenn.
   B. You will need to sign in with your Penn GIS account (*Girmaye can set this up for anyone who doesn't have one*).

   To download and install the software:
   C. Click on your profile icon at the top right corner of the page
   D. From the popup menu, click "my settings" -> then click "licenses" from the menu on the left
   E. Scroll down to ArcGIS Pro in the listed items under the licensed products -> click download ArcGIS Pro.

   After installation, launching ArcGIS Pro will prompt you to sign into your ArcGIS online account for authorization. The organization's URL is upenn.

This course requires the use of Canvas, including access to materials and assignment submission. Some videos posted via Canvas will require the use of speakers. I may utilize web-conferencing tools to deliver synchronous material. In order to participate in synchronous sessions (should they exist), you should have a computer, a webcam, headphones, and a microphone.

This course requires the use of Microsoft Office (i.e., Word, Excel, PowerPoint).

Students should check the canvas page for course updates.

Course Communications
During the semester, I will generally respond to emails within 24 hours of receiving them during the week and with 48 hours on weekends.

Grading Scale

A Range	B Range	C Range	D Range	F Range
A 94 - 100	B+ 87 - 89	C+ 77 - 79	D+ 67 - 69	F 0 - 59
A- 90 - 93	B 84 - 86	C 74 - 76	D 64 - 66	
	B- 80 - 83	C- 70 - 73	D- 60 - 63	

Weighting Details

Assessment Group	Percentage
Midterm Exam	5%
Final Exam	10%
Lab Assignments	60%
Individual Project Presentation	4%
Attendance	1%
Individual Project	20%

Lab Assignments

Each lab assignment involves experiential problem-solving using GIS software. Assignments typically require you to complete a Lab Report. Link to labs: mckeont/GIS-Mapping-Labs

Policies

1. I encourage students to work together on lab assignments and assist each other in understanding the course material. However, **all contents of each student's assignment submission (text and graphics) must be authored solely by that student**.

2. It is the student's responsibility to understand how data and projects are saved, and to manage and back up their own data and assignments (the lab assignments will indicate how to do this).

3. Labs up to 1 week late will be deducted 1 point. Labs 1-2 weeks late will be deducted 2 points. L**abs will still be accepted more than two weeks after their due date, however direct communication with me via e-mail is required along with submission.**

Exams
There will a midterm and a final exam. Each exam will cover all lectures, readings, lab assignments, or other material taught for specific modules. Make-up exams will be given only for documented medical emergencies.

Graduate Project
Graduate students are expected to propose, design, and execute an applied GIS project of their choice accompanied by a literature review.

Academic Integrity
Students are expected to adhere to the University's Code of Academic Integrity and Code of Student Conduct. Care should be taken to avoid violations, including but not limited to plagiarism; fabrication of information; submitting prior work; sharing your work with others or submitting work that is similar to a peer's work unless the assignment is clearly designated as a group assignment in the syllabus; discussing/sharing assignment or exam content with anyone other than your instructors without explicit prior permission from course faculty. We use Turnitin in this course and we take cheating and plagiarism seriously. Be sure to cite others appropriately when using their work. I have included basic resources below to assist you with understanding plagiarism specifically, but you should further explore the topic on your own and ask questions as needed to ensure you fully understand. Not knowing is not an excuse. Students will receive a zero on any assignment where violations occur; the penalty is the same regardless of whether you share your work or copy another's work. Additionally, students who engage in any actions that violate any codes of academic or student integrity will be referred to the Center for Community Standards and Accountability, which investigates and decides on sanctions in cases of academic dishonesty.

Disability Services and Accommodations
The University of Pennsylvania provides reasonable accommodations to students with disabilities who have self-identified and received approval from the Office of Disabilities Services. If Disabilities Services has approved your request for accommodations, please make an appointment to meet with me as soon as possible in order to discuss the arrangements for your accommodations. If you have not yet contacted Disabilities Services and would like to request accommodations or have questions, you can make an appointment by calling (215) 573-9235. The office is located in the Weingarten Center at Stouffer Commons, 3702 Spruce Street, Suite 300. Please visit the Disability Services website for additional information. These services are free and confidential.

Resources for Health and Safety

The following resources may be helpful to students, peers, or acquaintances who have or are experiencing violence or unhealthy behaviors in their relationships. Many of these resources are available remotely.

• National Domestic Violence Hotline: -800-799-SAFE (7233) Advocates are available to talk with callers 24/7
• Philadelphia Center Against Sexual Violence Hotline: 215-985-3333 24 hour, confidential hotline to support survivors of sexual abuse/assault. WOAR provides services to all survivors regardless of gender or sexual orientation.
• Penn Violence Prevention Campus Resources: Penn has a variety of campus resources available to support and assist students who may be impacted by sexual violence, relationship/domestic violence, stalking, and sexual harassment.
• Penn Resource Guide for Campus Services: Includes information on available resources, such as the Penn Women's Center, CAPS (Counseling & Psychological Services), Division of Public Safety, Chaplain, LGBT Center, etc.

Course Schedule

Subject to change – see Modules for up-to-date schedule.
Link to labs: mckeont/GIS-Mapping-Labs

Date (Week)	Module	Topic	Lab
1/13-1/17	1	Introduction to GIS and ArcGIS Pro	Lab 1
1/20-1/24	1	Introduction to GIS and ArcGIS Pro (Continue)	Lab 1 (Continue)
1/27-1/31	2	Projections and Coordinate Systems	Lab 2
2/3-2/7	3	Thematic Mapping	Lab 3
2/10-2/14	4	Tables and Attribute Data	Lab 4
2/17-2/21	5	Creating Geographic Data	Lab 5

2/24-2/28		**MIDTERM (ONLINE)**	Lab 5
3/3-3/7	6	Vector Data Models and Operations	Lab 6
3/10- 3/14		SPRING BREAK	SPRING BREAK
3/17 -3/21	7	Raster Data Models and Operations	Lab 7
3/24 -3/28	7	Raster Data Models and Operations continue	Lab 7
3/31 -4/4	8	Interactive Mapping with Leaflet JS /CSS/ HTML	Lab 8 [Different format Web Tool]
4/7 - 4/11		In class workshop	Catch up on Labs and work on individual project
4/14 - 4/18		Individual Project Presentations	
4/21 - 4/25		**FINAL EXAM, 2 hours (ONLINE)**	