Course Logistics

- Credits: 1
- Grade Mode: S/U; S at greater than C-
- Time/Location: 1/18-1/21, T W Th F 9:00am - 4:00pm EST via Zoom
- Instructors: Tracy Tien (htien@smith.edu), Jon Caris (jcaris@smith.edu)

Course Description

This one-credit interterm course introduces students to Geographic Information Systems (GIS) with spatial analysis techniques and spatial data visualization (map making). Students will gain fluency in maneuvering spatial data through field data collection, querying/analyzing, and visualizing/communicating the results using GIS software. The class foregrounds (geo)data literacy and ethics, peer-critique on cartographic and visual storytelling design, and multidisciplinary approaches to spatial inquiry.

The specific spatial analysis techniques students will learn includes:

- Basic navigation in the GIS software interface
- Classifying data and corresponding symbology
- Creating vector and raster data
- Common vector analysis: project, buffer, intersect, query/filter (extract by location), field calculator
- Network analysis: shortest and fastest path, travel cost
- Spatial statistics: sampling, basic statistics, nearest neighbor analysis, mean coordinates, and spatial interpolation
- Raster terrain analysis: hillshade, slope, raster calculator

Schedule

- 9:00am - 11:00am EST - Class time via Zoom (synchronous)
- 12:00pm - 3:00pm EST- Lab/homework time (asynchronous)
- 3:00pm - 4:00pm EST - End-of-day wrap-up over Zoom (synchronous)

	Topic	Assignments

T	Introducing GIS	• ***Read***:
		  ○ Princeton astrophysicists re-imagine world map, designing a less distorted, "radically different" way to see the world
		  ○ A "radically different" world map?
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		• ***Assignment***: Maps in the News - written analysis on spatial data visualizations used in news and media; students are asked to reflect on data sources, intent and effectiveness of the map use
		• ***Lab***:
		  ○ Read: 1.2 About the exercises

		○ Module 2: Creating & Exploring a Basic Map ○ Lesson 4.1: Using a print layout
W	Coordinate Systems, Datums, & Projections	• ***Watch***: Data is Like Plastic (lightning talk) • ***Read***: ○ Locked-in Data Production: User-Dignity and Capture in the Platform Economy ○ Five steps to practicing user-centered cartography ○ Critical cartography 2.0: from "participatory mapping" to authored visualizations of power and people --- • ***Lab***: ○ Module 3: Classifying Vector Data ○ Lesson 5.1: Creating a New Vector Dataset ○ Lesson 5.2: Feature Topology
Th	Spatial Data & Cartography	• ***Read***: ○ Ethical implications of technical limitations in GIS ○ Geoethics training in the Earth and environmental sciences --- • ***Lab***: ○ Module 6: Vector Analysis
F	Geoethics & Make It Work	• ***Assignment:*** ○ Final Course Self Reflection ○ Final Map Project • ***Lab***: ○ Module 7: Rasters

Learning Outcomes & Skill Acquisition

- Students will acquire proficiency in using GIS software through hands-on practice, demonstrations, and peer learning
- Students will learn and engage in various data collection methods in the field
- Students will learn foundational GIS concepts and applications
- Students will apply critical thinking to existing theoretical frameworks and practice design thinking in their cartographic process
- Students will become familiar with finding, assessing, and documenting spatial data
- Students will acquire appropriate terminology and language through readings that range from peer-reviewed journal articles, book chapters, to scientific articles written for a popular audience
- Students will apply effective scientific communication through written and verbal analysis, presentation of their findings, and peer-critique

Grading

S/U at greater than C-

Category	Assignments	Due Dates	Weight
Engagement	Select One (1) Assigned Reading & Submit Two (2) Prompts	9:00am on Assigned For Date	15%
QGIS Lab Tutorials	Module 1.2-2.4 & 4.1	1/18	35%
	Module 3 & 5.1-5.2	1/19	
	Module 6	1/20	
	Module 7	1/21	
Individual Reflections & Peer Feedback	Map in the News Forum	1/20	15%
	Map Critique	1/21	
	Final Course Self Reflection	1/23	
Final Map Project	Final map submission with short written report	1/23	25%
			Total: 100%

Course Prerequisites

No previous GIS experience is required. Open to all students. Basic computer proficiency, ability to participate in moderate physical activity for outdoor fieldwork is recommended. Physical limitations do not exclude learners from enrolling in this course.

Policies

Discussion Expectations

Mutual trust, personal respect and individual integrity are crucial to a supportive and inclusive environment that fosters achievement and learning. With this in mind, we invite enrolled students to dedicate themselves to free inquiry and to the exchange of ideas and criticism, while maintaining respect for the opinions and individuality of others.

Academic Conduct

Students and faculty at Smith are part of an academic community defined by its commitment to scholarship, which depends on scrupulous and attentive acknowledgement of all sources of information and honest and respectful use of college resources. Smith College expects all students to be honest and committed to the principles of academic and intellectual integrity in

their preparation and submission of coursework and examinations. All submitted work of any kind must be the original work of the student who must cite all the sources used in its preparation. Students voted to establish the academic honor system in 1944. The basis of the Academic Honor Code is articulated in Article X of the SGA Constitution and Article VII of the SGA Bylaws.

Late Assignment

All assignments and projects for this course must be received on the due date specified. Exceptions will be considered due to illness, family emergency, religious observance, class cancellation due to inclement weather, or other reasonable accommodation. If you know in advance that you cannot make a due date, it is your responsibility to contact the instructors to make arrangements.

Plagiarism

In the preparation of class, written work, and other data visualizations, intellectual honesty demands that a student properly acknowledge the source of all information gathered, including the work of other students. Please refer to the Student Handbook Academic Honor Code for further details.

Accommodations for Students with Disabilities

The Office of Disability Services works to ensure equal access for students, faculty, staff and visitors with disabilities to all programs and activities at Smith College. Facility and technology access, individual accommodations and services, along with educational programming are offered to help build an accessible and inclusive Smith College community. Disability Services seeks to support students in developing skills, learning about resources, and gaining the confidence needed to maintain a balanced and independent lifestyle that is essential to meeting individual, career and life objectives. Smith's commitment to providing accommodations and services is balanced with a humanistic and developmental approach that requires student engagement and responsibility in the accommodation process. Smith College Disability Services

Religious Observance

College policy states that any student who is unable because of religious observance to attend classes, participate in an examination, study, or work on a particular day will be excused from such activities without prejudice and will be given an opportunity to make them up, provided such makeup work does not create an unreasonable burden on the college. No fees will be charged for rescheduling an examination. It is each student's responsibility to request an excused absence from a faculty member well in advance of a religious holiday.

Diversity and Inclusion

Smith College fosters free access to knowledge, its unfettered discovery and communication through research and education, and the creation and sustenance of a community of scholars, students and staff. The Smith community can realize these goals only in an atmosphere of trust and respect. The college aspires to create and maintain an educational, working and living environment that is respectful of differences and free from harassing behavior.

To foster trust and respect in a diverse community, Smith College encourages community members to behave in ways that affirm respect for each other. Within an academic institution, teaching, research and learning are subject to the protections described in the college's policy on academic freedom. Actions or words used in the context of the academic curriculum and teaching environments that serve legitimate and reasonable educational purposes will not be evaluated as violating policies that bar certain behaviors, sexual harassment or unlawful discrimination.

In a diverse community, disagreements and conflicts, with varying degrees of seriousness, are inevitable. The college strongly encourages informal resolution of disputes and conflicts. Many issues are best resolved by direct communication between the individuals involved, sometimes with the help of a third party. Community members are expected to engage in good faith attempts to mediate their differences. To that end, all members of the Smith community are encouraged to use the deans, academic department chairs, supervisors and the staff members listed on this site to discuss concerns and seek resolution to differences. See Inclusion, Diversity, & Equity.