

GEOG 4904/7904-001 Geographic Information Systems for the Social Sciences

Prof. Mark Palmer
MW 4-5:30 PM
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Office: Stewart Hall 10B

Office Hours: Tuesday and Thursday 10:30 AM to 12:00 PM; or by appointment

This course is designed for social science students interested in learning about the tools available in GIS for linking to and analyzing spatial qualitative data. This course is not structured to provide a complete understanding of GIS principles and practices. Rather, the course makes use multiple data sources (qualitative and quantitative), applied within a social context, using spatial investigation procedures to detect geographical trends in data sets. At the conclusion of the course students, 1) will have a basic understanding of geographic information systems; 2) knowledge of quantitative and qualitative research methods and GIS; 3) participate in original geographic information social science research.

Class Period

MW 4:00 – 5:15PM

Readings

The main readings come from two books and several journal articles that I will provide or have on reserve at the main library. The books can be purchased at the MU bookstore.

Geographic Information Systems for the Social Sciences: Investigating Space and Place

By Steven Steinberg and Sheila Steinberg

GIS Analysis Volume 1: Geographic Patterns and Relationships by Andy Mitchell

GIS Analysis Volume 2: Spatial Measurements and Statistics by Andy Mitchell

Getting to Know ArcGIS Desktop Second Edition

By Ormsby, Napoleon, Burke, Groess, and Feaster

The syllabus, lecture presentations, reading assignments, lab exercises, and grades will be posted on Desire2Learn.

Evaluation

This is an upper-division/graduate level geography class. Active engagement in lectures, discussions and labs is expected. You will be required to create and write-up a research design proposal and complete final presentation that requires you to come up with questions, use methods discussed in class, and present results. Most of the lab work will require you to work independently. However, I am open to lab groups as well. We will schedule time in class for the GIS exercises. However, you may wish to come into the GIS lab to finish or build upon your technical skills. The exercises are essential to learning GIS in this course. I will provide four lab assignments, including data. Due dates will be on each assignment.

Four (4) GIS exercises x 100 pts each 400 pts
The four assignments will feature social science problems and build upon the GIS exercises found in *Getting to Know ArcGIS*

Final research design proposal and presentation 200 pts
Total Points **600 pts**

Grading Scale

97% - 100% = A+
93 - 96 = A
90 - 92 = A-
87 - 89 = B+
83 - 86 = B
80 - 82 = B-
77 - 79 = C+
73 - 76 = C
70 - 72 = C-
60 - 69 = D
59 and below = F

Course Outline

I. Introducing Geographic Information Systems, Geography, and Society

Introduction to geographic information systems and science: (Readings: Goodchild et. al; Steinberg)
What does geography and GIS have to offer to social science research? What is GIS? What is social science research? Quantitative and qualitative Research; Why is the spatial important in social science research?

Dissemination of geospatial information
Sharing data
Security and open access

Ethical aspects
Ethics and geospatial information

Critical GIS
Epistemological critiques
Ethnical critiques
Feminist critiques
Social critiques

Lab exercise #1 Due

II. Data Modeling and Spatial Data

Data Modeling
Databases
Tessellation data models
Raster modeling (case study)
Triangular irregular network (TIN) modeling (case study)
Vector modeling (case study)
Topological model
Classic vector data model
Network model

3-D and Temporal Modeling (case study)
Modeling three-dimensional entities
Spatio-temporal GIS

Geospatial Data

Georeferencing
Map projections
Data quality
GPS data (case study)
On-screen digitizing (case study)
Aerial photography (case study)

Lab exercise #2 Due

III. Analytical Methods

Basic analytical operations

Buffers
Overlays
Neighborhoods
Point pattern analysis
Centroids
Density surface
Cluster analysis
Cartographic modeling

Lab exercise #3 Due

IV. Design Aspects

Research design (Deductive and Inductive)

Representing information and processes (Steinberg and Steinberg)
Models: data, structures, procedures
Scope
Defining a problem
Social, political, and cultural issues?
Resource planning
Social science database design
Social science analysis design
Social science applications

V. Case Studies

Indigenous geographic information systems (Readings: Rundstrom; Turnbull, Palmer; Harmsworth)

Community-based GIS (Readings: Harris and Weiner; Sieber; Ghose; Elwood)

Historical GIS (Readings: Gregory and Haley; Rumsey and Williams; Ray; Cunfer)

Natural hazards research and GIS

Lab exercise #4 Due

Exercises et. al)	Topic	Pages (Ormsby
Ex 1:	Exploring ArcMAP pp.	17-39
Ex 2:	Exploring ArcCatalog pp.	47-69
Ex 3:	Symbolizing features and rasters pp. <i>Lab Assignment 1</i>	85-107
Ex 4:	Querying data pp.	197-215
Ex 5:	Joining and relating tables pp. <i>Lab Assignment 2</i>	225-239
Ex 6:	Analyzing relationships part one pp.	253-260
Ex 7:	Analyzing relationships part two pp.	301-335
Ex 8:	<i>Lab Assignment 3</i>	
Ex 9:	Creating and editing data part one pp.	357-374
Ex 10:	Creating and editing data part two pp.	383-392
Ex 11:	Geocoding pp.	429-449
Ex 12	<i>Lab Assignment 4</i>	

If you need accommodations because of a disability, if you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated, please inform me immediately. Please see me privately after class, or at my office.

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To request academic accommodations (for example, a note taker or extended time on exams), students must also register with the Office of Disability Services (<http://disabilityservices.missouri.edu>), S5 Memorial Union, 882-4696. It is the campus office responsible for reviewing documentation provided by students requesting academic accommodations, and for accommodations planning in cooperation with students and instructors, as needed and consistent with course requirements. For other MU resources for students with disabilities, click on "Disability Resources" on the MU homepage.

Academic integrity is fundamental to the activities and principles of a university. All members of the academic community must be confident that each person's work has been responsibly and honorably acquired, developed, and presented. Any effort to gain an advantage not given to all students is dishonest whether or not the effort is successful. The academic community regards breaches of the academic integrity rules as extremely serious matters. Sanctions for such a breach may include academic sanctions from the instructor, including failing the course for any violation, to disciplinary sanctions ranging from probation to expulsion. When in doubt about plagiarism, paraphrasing, quoting, collaboration, or any other form of cheating, consult the course instructor.

Policy on final grades

If you would like to know your final grade at the end of the semester, please provide a self-addressed envelope to me and I will send the grade to your home address. I will not send your grade through email or place the final letter grades on Blackboard.