

Geog 482/582: GIScience II

An in-depth exploration of the methods, theory, and practice of spatial analysis using GIS. Lectures cover data modeling, spatial analysis and GIS project design, exploring the place of the geographic information sciences in modern society. Labs focus on applied geospatial analysis and problem-solving with GIS, using ArcGIS Desktop software.

Lectures: M and W, 1 - 1:50 in 125 LLCN **Labs:** M or W, 2 - 3:50 in 442 McKenzie (SSIL)

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GTF / Lab Instructor: Swagata Goswami **email:** swagata@uoregon.edu

Readings: *Geographic Information Systems and Science 3e* Longley, Goodchild, Maguire, and Rhind (2011); as well as online readings.

Grading: Abide by University Plagiarism Guidelines

Undergraduate - Lab Assignments(40%) / Tests-Group Work(45%) / Final Project (including proposal and write-up) (15%)

Graduate - Lab Assignments(35%) / Tests-Group Work(45%) / Final Project, write-up, and Presentation(20%)

Schedule

Date	Lecture	Reading	Lab Exercise	Due
Week 1 M: 9-24	Geographic Information Sciences - what you should already know...	Ch. 1: Systems, Science, and Study. Ch. 5: Georeferencing. Online: GIS Foundations[About ArcGIS ; What is ArcGIS Desktop? ; What is GIS?]	Lab 1- ArcGIS Refresher. 20 points.	Week 2 by the beginning of lab

W: 9-26	Geographic Data Models and Structures	<p>Ch. 3: Representing Geography Ch. 8: Geographic Data Modeling.</p> <p>Online: How GIS represents and models geographic information ; What is GIS interoperability? ; About geographic data formats ; What is CAD data? ; What is a coverage? ; What is a geodatabase? ; A quick tour of the geodatabase ; Feature class basics ; Raster basics ; Table basics ; What are geometric networks? ; About KML support in ArcGIS ; What is a network dataset? ; Discrete and continuous data ; What is a shapefile? ; What is a TIN surface? ; What is raster data? ; Raster bands ; A quick tour of metadata</p>		
Week 2 M: 10-1	Map Projections and Coordinate Systems	<p>Ch. 5: Georeferencing. Ch. 7: GIS Software.</p> <p>Online Reading: Cartography: Thematic Map Design (1999). Dent, B. Chapters 2 - 3 ; "Understanding Map Projections" (available on Blackboard)</p>	Lab 2 - Data Input and Editing in ArcGIS. 20 points	Lab 1 due
W: 10-3	Data Classification / Basic Map Design	<p>Ch. 12: Cartography and Map Production Ch. 13: Geovisualization</p>		
Week 3 M: 10-8	Test 1		Lab 3 - Spatial Queries and Measurements. 20 points	Lab 2 due
W: 10-10	Spatial Analysis	Ch. 14: Spatial Data Analysis		
Week 4 M: 10-15	Raster Analysis Issues - Overlay introduction		Lab 4 - Spatial Decision Making with Vector and Raster Data. 30 points	Lab 3 due

W: 10-17	Overlays / Multi-criteria Evaluation			
Week 5 M: 10-22	Test 2			
W: 10-24	Density surfaces and interpolation	Ch. 14: Spatial Data Analysis (Sections 14.3.5 to 14.3.6.4)		
Week 6 M: 10-29	Surface Analysis	Ch. 15: Spatial Analysis and Inference (through 15.3.4)	Lab 5 - Surface and Visibility Analysis with Raster Data. 20 points	Lab 4 due
W: 10-31				
Week 7 M: 11-5	Modeling - Introduction to Final Project	Ch. 16 - Spatial Modeling with GIS	Lab 6 - Introduction to Your Final Project. 100 points	Lab 5 due
W: 11-7	More on modeling			
Week 8 M: 11-12	Network Analysis - locating points	Ch. 15: Spatial Analysis and Inference (15.4 to end)	Final Project	
W: 11-14	GIS Data Sources	Ch. 9: Geographic Data Collection	Final Project	
Week 9 M: 11-19	GIS Data Sources / GIS Design: Output and Visualization	Ch. 13: Geovisualization	Final Project	
W: 11-21	GIS operating issues	Ch. 18: Operating Safely with GIS	Final Project	
Week 10 M: 11-26	Project presentations	Grad project summaries	Final Project	

W: 11-28	Test 3		Final Project	
Week 11 W: 12-5	Final Lab due	by Noon - Wednesday, December 5		