

GEOG 5520 - Intermediate GIS

Spring, 2009. Monday 6:00 - 8:50 PM, EESAT 110

(This syllabus is for graduates only. See GEOG 4520 for undergraduate syllabus)

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Prerequisites

GEOG 4500/5500: Introduction to GIS (or consent of department)

Objectives

This course is built on GEOG 4500 "Introduction to GIS". Some intermediate GIS topics will be introduced through a combination of lectures, hands-on exercises, and individual projects. The course objectives are the following:

- (1) Understand vector and raster data models and conversions;
- (2) Understand common map algebra functions in ArcGIS;
- (3) Develop advanced skills for raster data manipulation in ArcGIS;
- (4) Learn about surface analysis, 3-D rendering, and relevant applications;
- (5) Understand network analysis and solve road network problems;
- (6) Develop GIS spatial modeling skills to solve real world problems.

Textbooks

- (1) Jill McCoy and Kevin Johnston, *Using ArcGIS Spatial Analyst*. ISBN: 1-58948-105-4, 233 pages, ESRI (**Note:** A PDF version is available for use in CSAM labs).
- (2) Michael J. de Smith, Michael F. Goodchild, and Paul A. Longley, *Geospatial Analysis* (free web version: <http://www.spatialanalysisonline.com/output/>).

Homework

Six individual homework assignments (7% each) will be submitted online (instructions will be provided in the class). Late homework will be marked down 10% for every day late.

Course Projects

Two course projects will be provided in Week 7 and Week 12. With instructor's consent, you can also design your own course projects. Project reports (Word documents) should be submitted before May 15.

Grading Structure

Six Homework Assignments (7% each)	42%
Midterm Exam	15%
Final Exam	15%
Two Course Projects (for graduates)	28%
Total	100%
90-100: A; 80-89: B; 70-79: C; 60-69: D; 0-59: F. A minimum grade of "B" is required for the GIS Certificate.	

Schedule

Each class has an instruction session followed by an in-class exercise session.

Week	Date	Topic	Homework
2	Jan 26	(1) Course Introduction (2) Brief Review: Introduction to GIS (3) Vector and Raster Data Models <i>Exercise: Raster Display and Query, Vector/Raster Conversion</i>	Read Chapter 4 (pp. 73-90)
3	Feb 2	More on Raster Data: Grids and Images <i>Exercise: Grid/Image Conversion, Grid Projection, Image World File</i>	Homework 1 (due Feb 17)
4	Feb 9	Distance and Local Operations	Read handouts
5	Feb 16	Focal Operations and Applications <i>Exercise: Filtering and Focal Statistics</i>	Homework 2 (due Mar 3)
6	Feb 23	Zonal Operations and Applications <i>Exercise: Zonal Geometry and Zonal Statistics</i>	Read handouts
7	Mar 2	Map Algebra and Raster Calculator <i>Exercise: Map Algebra Expression and Raster Calculator</i>	Homework 3 (due Mar 24)
8	Mar 9	Midterm Exam (6 - 8 pm)	
9	Mar 16	Spring Vacation (No class)	
10	Mar 23	Spatial Interpolation <i>Exercise: Generate statistical surfaces from point data</i>	Homework 4 (due Apr 7)
11	Mar 30	Surface Analysis <i>Exercise: DEM and Flood Mapping</i>	Read handouts Work on projects
12	Apr 6	Hydrologic Modeling <i>Exercise: Hydrologic Modeling in the Upper Trinity River, North Texas</i>	Homework 5 (due Apr 21) Work on projects
13	Apr 13	Three-Dimensional Rendering <i>Exercise: Constructing 3-D Models Using LIDAR Data</i>	Work on projects
14	Apr 20	Network Analysis <i>Exercise: Drive time analysis for the DFW and Bush Airports</i>	Homework 6 (due May 5)
15	Apr 27	Mobile GIS and Related Technologies <i>Exercise: Importing GPS Data into ArcGIS</i>	Work on projects
16	May 4	(Pre-final week): No class	Work on projects; Prepare for final exam.
17	May 11	Final Exam (6 - 8 pm)	Course project due May 15

Extra Credit

The Department of Geography does not allow extra credit assignments (work not specified on a course syllabus).

Academic Dishonesty

Students caught cheating or plagiarizing will receive a "0" for that particular assignment or exam. Additionally, the incident will be reported to the Office of Student Rights and Responsibilities for further penalty. According to the UNT catalog, the term "cheating" includes, but is not limited to:

- a. Use of any unauthorized assistance in taking quizzes, tests, or examinations;
- b. Dependence upon the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments;
- c. The acquisition, without permission, of tests or other academic material belonging to a faculty or staff member of the university;
- d. Dual submission of a paper or project, or resubmission of a paper or project to a different class without express permission from the instructor(s); or
- e. Any other act designed to give a student an unfair advantage.

The term "plagiarism" includes, but is not limited to:

- a. The knowing or negligent use by paraphrase or direct quotation of the published or unpublished work of another person without full and clear acknowledgment; and
- b. The knowing or negligent unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials.

Accommodations

The Department of Geography, in cooperation with the Office of Disability Accommodation, complies with the Americans with Disabilities Act in making reasonable accommodations for qualified students with disabilities. Please present your written accommodation request before the 12th class day.

Classroom Courtesy

Please follow these guidelines to avoid disrupting the class:

- (1) Turn off cell phones before arriving.
 - (2) Do not arrive late or leave early (except for a bathroom break or emergency).
 - (3) Do not sleep or eat during class.
 - (4) Do not work on other assignments during class.
 - (5) Do not talk when the instructor is lecturing, unless prompted for feedback by the instructor.
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