

GEOG 4550 - Advanced GIS

Fall, 2013. Wednesdays 6:00 - 8:50 PM, ENV 391

(This syllabus is for undergraduates only. See GEOG 5550 for graduate syllabus)

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Office Hours: Wednesdays 3:00 – 4:00 PM, Thursdays 11:00 AM – 1:00 PM

Prerequisites

GEOG 3500 “Introduction to GIS” and GEOG 4520 “Intermediate GIS” (or consent of department).

Objectives

This course is built on GEOG 3500 “Introduction to GIS” and GEOG 4520 “Intermediate GIS”. Some advanced GIS topics are introduced through a combination of lectures, hands-on exercises, ESRI training courses, and individual projects. The course objectives are the following:

- (1) Learn about the new features of ArcGIS and general practices of GIS project design;
- (2) Develop a deeper understanding of raster/vector data structure and manipulation;
- (3) Learn how to create, edit, and manage geodatabases;
- (4) Design geoprocessing models using ModelBuilder to solve application problems;
- (5) Learn how to manage LiDAR data and use LiDAR data in real applications;
- (6) Learn about some advanced topics in spatial analysis and modeling.

Reference Materials:

Research papers and short articles will be provided. Please DO NOT print the papers in the CSAM labs.

Labs and Projects

Each class has an instruction session followed by a lab session. In the lab session, students will work on lab exercises or individual projects. Two individual projects (Project 1 and Project 2) will be turned in and marked. Late projects will be marked down 10% for every day late. Project handouts and data are available at R:\class\4550\Projects.

In addition to Project 1 and Project 2, students are required to complete a final project in an area of GIS applications for a specific geographic area. A project plan of 1-3 single-spaced pages should be submitted (saved to R:\) **by October 2nd**. Students may need to modify their project plans based on the feedback from the instructor. A final project report of **8-15 single-spaced pages in PDF format** should be submitted (saved to R:\) **on or before December 11th**. Detailed requirements of the project will be distributed in class. Samples of previous student projects are available at <http://www.geog.unt.edu/~pdong/AdvancedGIS.htm>.

Required ESRI Training Courses (Passcodes will be provided in class)

- (1) “Building Models for GIS Analysis Using ArcGIS 10” (3 hours).
- (2) “Working with LiDAR Data” (free) (1 hour).
- (3) “Managing LiDAR Data Using LAS Datasets” (2 hours).
- (4) “Managing LiDAR Data Using Terrain Datasets” (3 hours).

ESRI training course certificates for (1), (3) and (4) should be submitted (saved to R:\) by December 11th.

Schedule

Week	Date	Topic	Assignments
1	08/28	What’s New in ArcGIS?	1) Read “ <i>What is the geographic approach?</i> ”
2	09/04	GIS Project Design	2) Explore final project ideas and data.
3	09/11	Building Geodatabases	3) Review literature for your final project.
4	09/18	Vector Data Structure and Manipulation	4) Work on geodatabase exercises 1 – 8.
5	09/25	Raster Data Structure and Manipulation	5) Submit final project plan 10/02.
6	10/02	Uncertainty and Accuracy in GIS	(1-3 single-spaced pages, save to R:\). 6) Work on Project 1.
7	10/09	Designing Geoprocessing Models	1) Work on ESRI training course “Building Models for GIS Analysis Using ArcGIS 10”.
8	10/16	LiDAR Point Clouds and Terrain Datasets	2) Work on ESRI training course “Working with LiDAR Data”. (free)
9	10/23	3D Urban Models – Visualization and Applications	3) Work on ESRI training course “Managing LiDAR Data Using LAS Datasets”.
10	10/30	Digital Elevation Models and Environmental Modeling	4) Work on ESRI training course “Managing LiDAR Data Using Terrain Datasets”.
11	11/06	Scale and Spatial Heterogeneity in GIS	5) Submit Project 1 on 10/23.
12	11/13	Voronoi Diagrams in GIS	1) Start working on Project 2.
13	11/20	Volunteered Geographic Information	2) Continue to work on final project.
14	11/27	Project Week - Work on your final project.	3) Continue to work on ESRI training courses.
15	12/04	Pre-Final Week (no class)	4) Submit Project 2 on 11/20.
16	12/11	Final Week – Work on your final project.	Work on your final project.
			Work on your final project.
			1) Submit ESRI training course certificates (3) on 12/11.
			2) Submit final project report on 12/11.

Deliverables (refer to schedule for due dates)

- (1) Final project plan (**Word file**).
- (2) Project 1 (**Word file**).
- (3) Project 2 (**Word file**).
- (4) Three ESRI training course certificates (**PDF files**).
- (5) Final project report (**Single-spaced PDF file, 8-15 pages**).

Grading Structure (90-100: A, 80-89: B, 70-79: C, 60-69: D, 0-59: F)

Items	Undergraduates	Graduates
Class Attendance	5%	5%
Project 1 and Project 2	40%	30%
Three ESRI Training Course Certificates	30%	30%
Final Project Report	25%	35%

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.

Extra Credit

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

Classroom Courtesy

Please follow these guidelines to avoid disrupting the class:

- a. Turn off cell phones before arriving;
- b. Do not arrive late or leave early (except for a bathroom break or emergency);
- c. Do not sleep during class;
- d. Do not work on other assignments during class;
- e. Do not talk or whisper to neighbors (except for formal class interaction).

Student Evaluation of Teaching Effectiveness (SETE)

The Student Evaluation of Teaching Effectiveness (SETE) is a requirement for all organized classes at UNT. This short survey will be made available to you at the end of the semester, providing you a chance to comment on how this class is taught. I am very interested in the feedback I get from students, as I work to continually improve my teaching. I consider the SETE to be an important part of your participation in this class. At the end of the semester, please visit <https://sete.unt.edu> and login using your EUID and password to complete the short survey.
