

GEOG 4520 - Intermediate GIS

Spring, 2017. Monday 6:00 – 6:50 PM, ENV 115; 7:00 – 8:50 PM, ENV 336.

(This syllabus is for undergraduates only. See GEOG 5520 for graduate syllabus)

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Prerequisites

GEOG 3500: Introduction to GIS (or consent of department)

Objectives

This course is built on GEOG 3500 "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) Learn about vector and raster data models and conversions;
- (2) Develop skills for raster data manipulation in ArcGIS;
- (3) Learn about spatial analysis, 3-D analysis, and relevant applications;
- (4) Understand network analysis and applications.

Textbooks

- (1) Online ArcGIS Resource Center, ESRI
<http://desktop.arcgis.com/en/arcmap/10.4/extensions/main/about-arcgis-for-desktop-extensions.htm> (Spatial Analyst, 3D Analyst, Network Analyst, and ArcScan)
- (2) Michael J. de Smith, Michael F. Goodchild, and Paul A. Longley, *Geospatial Analysis*, 5th Edition, 2015. (Free web version: <http://www.spatialanalysisonline.com/HTML/index.html>).

Homework

Six individual homework assignments (9% each) will be graded. Late homework will be marked down 10% for every day late.

Course Project

The instructor will provide one course project after Spring Break. With instructor's consent, students can also design their own course projects.

Grading Structure

Six Homework Assignments (9% each)	54%
Midterm Exam	15%
Final Exam	15%
One Course Project (for undergraduates)	16%
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 23	(1) Course Introduction and Brief Review (2) Vector and Raster Data Models <i>Exercise: Raster Display and Query, Vector/Raster Conversion</i>	Online ArcGIS Resource Center
3	Jan 30	Grids and Images <i>Exercise: Grid/Image Conversion and Grid Projection</i>	Homework 1 (due Feb 13)
4	Feb 6	Distance and Local Operations <i>Exercise: Local Statistics</i>	Read handouts
5	Feb 13	Focal Operations and Applications <i>Exercise: Filtering and Focal Statistics</i>	Homework 2 (due Feb 27)
6	Feb 20	Zonal Operations and Applications <i>Exercise: Zonal Geometry and Zonal Statistics</i>	Read textbooks
7	Feb 27	Map Algebra and Raster Calculator <i>Exercise: Map Algebra Expression and Raster Calculator</i>	Homework 3 (due Mar 27)
8	Mar 6	Midterm Exam (6 - 8 pm)	
9	Mar 13	Spring Break (No class)	
10	Mar 20	ArcScan <i>Exercise: Generating feature classes using ArcScan</i>	Read textbooks
11	Mar 27	Spatial Interpolation <i>Exercise: Generate statistical surfaces from point data</i>	Homework 4 (due Apr 10)
12	Apr 3	Surface Analysis <i>Exercise: DEM, TIN and Terrain Models</i>	Read textbooks Work on project
13	Apr 10	Hydrologic Modeling <i>Exercise: Hydrologic Modeling in the Upper Trinity River, North Texas</i>	Homework 5 (due Apr 24) Work on project
14	Apr 17	Three-Dimensional Rendering <i>Exercise: Constructing 3-D Models Using LIDAR Data</i>	Work on project
15	Apr 24	(1) Network Analysis (2) Course Review <i>Exercise: Drive time Analysis for the DFW and Bush Airports</i>	Homework 6 (due May 8)
16	May 1	Project Week (work on your projects).	Work on project; Prepare for final exam.
17	May 8	Final Exam (6 - 8 pm)	Course project due May 8

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 University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with an accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the Office of Disability Accommodation website at <http://www.unt.edu/oda>. You may also contact them by phone at 940.565.4323.

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.

Course Evaluation

You will receive an email with a link to the UNT Student Perceptions of Teaching (SPOT) Course Evaluation by the end of the semester.