

## **GEOG 4550 – Advanced GIS**

Spring 2018. Wednesdays 6:00 – 8:50 PM, ENV 336.

**(This syllabus is for undergraduates only. See GEOG 5550 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 advanced GIS topics will be introduced through a combination of lectures, hands-on exercises, Esri E-Learning courses, and individual projects. The course objectives are the following:

- (1) Understand vector, raster, terrain, and TIN data models and conversions;
- (2) Develop skills in local, focal, zonal, and global raster data manipulation in ArcGIS;
- (3) Develop skills in spatial interpolation, surface analysis, hydrological modeling, 3-D analysis, and network analysis;
- (4) Understand geospatial big data.

### **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, ArcScan, 3D Analyst, and Network Analyst)
- (2) Michael J. de Smith, Michael F. Goodchild, and Paul A. Longley, *Geospatial Analysis*, 5<sup>th</sup> Edition, 2015. (Free web version: <http://www.spatialanalysisonline.com/HTML/index.html>).

### **Homework**

Two individual homework assignments will be graded. Late homework will be marked down 10% each day.

### **Esri E-Learning Courses**

- (1) Basics of Raster Data
- (2) Introduction to Surface Modeling Using ArcGIS
- (3) Using Raster Data for Site Selection
- (4) 3D Analysis of Surfaces and Features Using ArcGIS

## Course Project

Each student will design and implement a course project involving raster data analysis. A project report of 3-4 single-spaced pages will be graded. More instructions on the project will be provided in class.

## Grading Structure

Class attendance and labs	14%
Two homework assignments (8% each)	16%
Midterm Exam	15%
Final Exam	15%
Four Esri E-Learning courses (5% each)	20%
Course Project	20%
<b>Total</b>	<b>100%</b>
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 a lab session.

Week	Date	Topic	Note
1	Jan 17	Vector and Raster Data Models	
2	Jan 24	Local Operations	Start E-Learning Course 1
3	Jan 31	Focal Operations	Start working on Homework 1
4	Feb 7	Zonal Operations	
5	Feb 14	Global Operations	
6	Feb 21	Spatial Interpolation	Homework 1 due
7	Feb 28	Surface Analysis	Start E-Learning Course 2
8	Mar 7	Midterm Exam (6 – 8 pm)	
9	Mar 14	Spring Break (No class)	
10	Mar 21	Raster Generalization	
11	Mar 28	Hydrologic Modeling	Start E-Learning Course 3
12	Apr 4	ArcScan	
13	Apr 11	Three-Dimensional Analysis	Start working on Homework 2
14	Apr 18	Network Analysis	Start E-Learning Course 4
15	Apr 25	Geospatial Big Data	Homework 2 due
16	May 2	Project Week (work on your project)	
17	May 9	Final Exam (6 – 8 pm)	Course project due

## 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.