

# **GEOG 4570 – Special Topics in GIS: Advanced GIS Programming**

Spring, 2011. Tuesday 6:00 - 8:50 PM, ENV 336

(This syllabus is for undergraduates only. See GEOG 5570 for graduate syllabus)

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Office Hours: Mon 4:30 – 6:00 PM, Tue 4:30 – 6:00 PM, or by appointment.

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## **Prerequisites**

GEOG 4560/5560: Introduction to GIS Programming (or consent of department)

## **Objectives**

This course includes lectures, hands-on exercises, homework assignments, and a programming project. It is for those who work with ESRI's ArcGIS on a technical level and have knowledge in programming with Visual Basic (VB) or Visual Basic for Applications (VBA). Based on the knowledge of VBA, students will learn about ArcObjects architecture and ArcGIS customization using VBA. Emphasis will be placed on the ArcMap and Map Layer objects which are inseparable components of GIS applications built with ArcGIS. Methods and examples of accessing feature layers, raster layers, and TIN/Terrain layers will be introduced. For undergraduate students, working with TIN/Terrain layers using ArcObjects is optional. It is expected that students will learn some advanced skills in ArcGIS programming using VBA after completion of this course.

## **Textbook**

Robert Burke, 2003, Getting to Know ArcObjects - Programming ArcGIS with VBA. ESRI Press. ISBN 158948018X. 422 pages (with CD-ROM).

## **In-Class Exercises and Homework**

In-class exercises should be saved in your folder at R:\CSAM\class\4570\AdvGISProg\StudentFolders\. The instructor will check your in-class exercises every Wednesday. If you miss a class, you should contact the instructor and finish the in-class exercises by the following Wednesday. Class attendance and in-class exercises count 10% of the final grade.

Five individual homework assignments (12% each) will be turned in and marked. Late homework will be marked down 10% for every day late. Homework files should be saved in your folder at R:\CSAM\class\4570\AdvGISProg\StudentFolders\.

## **Project**

Two individual programming projects will be distributed in class, one for undergraduate students, and the other for graduate students.

## Grading Structure

Class Attendance and In-Class Exercises	10%
Five Homework Assignments (12% each)	60%
Midterm Exam (closed-book written exam)	15%
Final Project (programming project)	15%
<b>Total</b>	<b>100%</b>
90-100: A; 80-89: B; 70-79: C; 60-69: D; 0-59: F.	

## Schedule

Week	Date	Topic	Exercises
1	Jan 18	(a) Course Introduction and ArcGIS Customization (b) VBA Overview (1): Forms, Controls, Properties, Events, Methods, and Variables	Chapters 2, 3, and 4
2	Jan 25	VBA Overview (2): Decisions, Subroutines, Functions, Arrays, Collections, and Loops <i>In-Class Exercises &amp; Homework 1 (Due Feb 8)</i>	Chapters 5, 6, and 7
3	Feb 1	Classes and Objects <i>In-Class Exercises</i>	Chapters 1 and 9
4	Feb 8	Interfaces and Object Model Diagrams <i>In-Class Exercises &amp; Homework 2 (Due Feb 22)</i>	Chapters 10 and 11
5	Feb 15	Tools and Commands <i>In-Class Exercises</i>	Chapters 12 and 13
6	Feb 22	Accessing Maps and Layers <i>In-Class Exercises &amp; Homework 3 (Due Mar 22)</i>	Chapters 14 and 15
7	Mar 1	Programming Tips, Code Sample, and Midterm Review <i>In-Class Exercises</i>	
8	Mar 8	Midterm Exam (6:00 – 8:00 pm)	
9	Mar 15	Spring Vacation (no class)	
10	Mar 22	Querying Feature Layers <i>In-Class Exercises &amp; Homework 4 (Due Apr 5)</i>	Chapter 17
11	Mar 29	Spatial Selection and Field Calculation <i>In-Class Exercises</i>	Chapter 18
12	Apr 5	Accessing Raster Layers <i>In-Class Exercises &amp; Homework 5 (Due Apr 19)</i>	Handouts
13	Apr 12	Project Week: Working on Your Programming Project	
14	Apr 19	Accessing TIN and Terrain Layers <i>In-Class Exercises</i>	Handouts
15	Apr 26	Final Review <i>In-Class Exercises</i>	Handouts
16	May 3	Pre-final Week: No class. Working on Your Project	
17	May 10	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 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.

## **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.