

# **GEOG 4590 – Advanced GIS Programming**

Spring, 2015. Tuesday 6:00 – 8:50 PM, ENV 340

(This syllabus is for undergraduates only. See GEOG 5590 for graduate syllabus)

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ENV 310B

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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: Introduction to GIS Programming (or consent of department)

## **Objectives**

This course includes lectures, demos, 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 C#. Based on the knowledge of Visual C#, students will learn about ArcGIS customization using ArcObjects and add-ins. Methods and examples of accessing maps and layers will be introduced, followed by spatial and attribute queries. It is expected that students will learn how to build and deploy add-ins for ArcGIS Desktop after completion of this course.

## **Textbooks**

- (1) Tony Gaddis, *Starting out with Visual C# 2010* (second edition). Addison-Wesley. ISBN-13:978-0-13-216545-7.
- (2) Pouria Amirian, *Beginning ArcGIS for Desktop Development Using .NET*. Wrox. ISBN-10: 1118442547, ISBN-13: 978-1-118-44254-8.
- (3) ESRI, *Developing with ArcGIS* (available at the ArcGIS Resource Center):  
[http://help.arcgis.com/en/sdk/10.0/arcobjects\\_net/conceptualhelp/index.html#/Developing\\_with\\_ArcGIS/0001000001ww000000/](http://help.arcgis.com/en/sdk/10.0/arcobjects_net/conceptualhelp/index.html#/Developing_with_ArcGIS/0001000001ww000000/)

## **Software**

ArcGIS Desktop (ArcInfo 10), ArcObjects Software Development Kit (SDK) for .NET, and Microsoft Visual Studio 2010.

## **Project**

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

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

In-class exercises should be saved in your folder at R:\class\4590\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:\class\4590\StudentFolders\.

## Schedule

| Week | Date   | Topic   |
|------|--------|---|
| 1    | Jan 20 | Course Introduction and ArcGIS Customization<br><i>Demos</i>  |
| 2    | Jan 27 | C# Overview (1): Controls, Properties, Events, Variables, and Data Types<br><i>Demos and In-Class Exercises,</i>                    |
| 3    | Feb 3  | C# Overview (2): Methods, Decisions, Arrays, Collections, and Loops<br><i>Demos and In-Class Exercises, Homework 1 (Due Feb 18)</i> |
| 4    | Feb 10 | Classes and Objects<br><i>Demos and In-Class Exercises</i>  |
| 5    | Feb 17 | ArcObjects and Object Model Diagrams<br><i>Demos and In-Class Exercises, Homework 2 (Due Mar 4)</i>                                 |
| 6    | Feb 24 | Building Add-ins for ArcGIS Desktop (1)<br><i>Demos and In-Class Exercise</i>   |
| 7    | Mar 3  | Building Add-ins for ArcGIS Desktop (2)<br><i>Demos and In-Class Exercise, Homework 3 (Due Mar 25)</i>                              |
| 8    | Mar 10 | Midterm Exam (6:00 – 8:00 pm)   |
| 9    | Mar 17 | Spring Break (no class)   |
| 10   | Mar 24 | Accessing Maps and Layers (1)<br><i>Demos and In-Class Exercises, Homework 4 (Due Apr 8)</i>  |
| 11   | Mar 31 | Accessing Maps and Layers (2)<br><i>Demos and In-Class Exercises</i>  |
| 12   | Apr 7  | Performing Spatial Query and Attribute Query (1)<br><i>Demos and In-Class Exercise, Homework 5 (Due Apr 22)</i>                     |
| 13   | Apr 14 | Performing Spatial Query and Attribute Query (2)<br><i>Demos and In-Class Exercises</i>   |
| 14   | Apr 21 | Demos and Instructor-led Exercises  |
| 15   | Apr 28 | Project Week (work on your project)   |
| 16   | May 5  | Pre-final Week (No class. Work on your project.)  |
| 17   | May 12 | <b>Project Due</b>  |

## 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. A minimum grade of "B" is required for the GIS Certificate. |             |

## **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.

### **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.

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