

GEOG 4590 – Advanced GIS Programming

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

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

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Office Hours: Mondays 4:30 – 6:00 PM, Wednesdays 4:30 – 6:00 PM, or by appointment.

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 Python. Based on the knowledge of Python, students will learn about ArcPy classes and functions, ArcPy mapping and data access modules, Python tools, toolboxes, add-ins, and raster processing in moving windows (neighborhoods). Students will develop skills to improve GIS productivity, implement customized GIS applications, and create new GIS tools using the Python programming language.

Reference

ArcGIS 10.4 Resources (under Python and ArcPy):

<http://desktop.arcgis.com/en/arcmap/10.4/analyze/main/what-is-geoprocessing.htm>

Software

ArcGIS Desktop 10.4.1.

Project

A programming project (30%) will be distributed in class.

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 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% each day. Homework and project files should be saved in your folder at R:\class\4590\StudentFolders\.

Schedule

Week	Date	Topic
2	Jan 22	Course Introduction and Python Review <i>Demos and In-Class Exercises</i>
3	Jan 29	Advanced Labeling and Field Calculation with Python <i>Demos and In-Class Exercises. Homework 1 (Due Feb 12)</i>
4	Feb 5	ArcPy Classes and Functions <i>Demos and In-Class Exercises</i>
5	Feb 12	ArcPy Mapping Module (1) <i>Demos and In-Class Exercises. Homework 2 (Due Feb 26)</i>
6	Feb 19	ArcPy Mapping Module (2) <i>Demos and In-Class Exercises</i>
7	Feb 26	ArcPy Data Access Module (1) <i>Demos and In-Class Exercises. Homework 3 (Due Mar 19)</i>
8	Mar 5	ArcPy Data Access Module (2) <i>Demos and In-Class Exercise</i>
9	Mar 12	Spring Break (no class)
10	Mar 19	Using Tools and Toolboxes in Python <i>Demos and In-Class Exercise. Homework 4 (Due Apr 2)</i>
11	Mar 26	Developing Python Add-ins for ArcGIS Desktop <i>Demos and In-Class Exercise. Programming Project (Due May 7)</i>
12	Apr 2	Python Add-in Classes: Buttons, Tools, and Combo Boxes <i>Demos and In-Class Exercises</i>
13	Apr 9	Raster Processing in Moving Windows (Neighborhoods) <i>Demos and In-Class Exercises. Homework 5 (Due Apr 23)</i>
14	Apr 16	Programming and Application Demos <i>Demos and In-Class Exercises</i>
15	Apr 23	Review and Q&A Sessions
16	Apr 30	Project Week (work on your project)
17	May 7	Project Due

Grading Structure

Class Attendance and In-Class Exercises	10%
Five Homework Assignments (12% each)	60%
Final Project (programming project)	30%
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.	

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.