GEOG 4590 – Advanced GIS Programming

Spring 2021. Remote asynchronous class.

Dr. Pinliang Dong
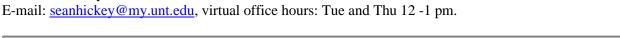Professor, Department of Geography and the Environment
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Prerequisite

GEOG 4560: Introduction to Python 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 advanced labeling and field calculation with Python, ArcPy classes and functions, ArcPy mapping, data access, and spatial analysis 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

ArcPy Documentation:
https://desktop.arcgis.com/en/arcmap/10.7/analyze/arcpy/what-is-arcpy-.htm

Software: ArcGIS Desktop 10.7.1 and PyCharm.

Labs and Homework

Labs (25%) and homework (50%) should be submitted to Canvas. Late labs and homework will be marked down 10% each day.

Project

A programming project (25%) will be distributed in class. Project files should be submitted to Canvas.

Extra Credit

The Department of Geography and the Environment does not allow extra credit assignments (work not specified on a course syllabus).

Grading Structure

Labs	25%
Five Homework Assignments (10% each)	50%
Programming Project	25%
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

Week	Dates	Topic
1	1/11 – 1/15	Course Introduction and Python Review (1) *Demos and Lab 1*
2	1/18 – 1/22	Python Review (2) *Demos and Lab 2*
3	1/25 – 1/29	Advanced Labeling and Field Calculation with Python *Demos and Lab 3.* ***Homework 1 (Due 2/19)***
4	2/1 – 2/5	ArcPy Classes and Functions *Demos and Lab 4*
5	2/8 – 2/12	ArcPy Mapping Module (1) *Demos and Lab 5*
6	2/15 – 2/19	ArcPy Mapping Module (2) *Demos and Lab 6.* ***Homework 2 (Due 3/5)***
7	2/22 – 2/26	ArcPy Data Access Module (1) *Demos and Lab 7*
8	3/1 – 3/5	ArcPy Data Access Module (2) *Demos and Lab 8.* ***Homework 3 (Due 3/19)***
9	3/8 – 3/12	Using Tools and Toolboxes in Python (1) *Demos and Lab 9*
10	3/15 – 3/19	Using Tools and Toolboxes in Python (2) *Demos and Lab 10.* ***Homework 4 (Due 4/9)***
11	3/22 – 3/26	Developing Python Add-ins for ArcGIS Desktop (1) *Demos and Lab 11.* ***Programming Project (Due 4/30)***
12	3/29 – 4/2	Developing Python Add-ins for ArcGIS Desktop (2) *Demos and Lab 12*
13	4/5 – 4/9	Spatial Analyst Module *Demos and Lab 13.* ***Homework 5 (Due 4/30)***
14	4/12 – 4/16	Application and Code Samples *Demos and Lab 14*
15	4/19 – 4/23	Project Week (work on your project)
16	4/26 – 4/30	**Final Week. Programming Project Due on 4/30**

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.