430.618.81 - Advanced Python Scripting for GIS

Instructor, Course Information & Objectives

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*Advanced Academic Programs*
*Zanvyl Krieger School of Arts and Sciences*
*Johns Hopkins University*
*430.618.81 - Advanced Python Scripting for GIS*

Instructor Information
Instructor: Andrew Chapkowski
Email Address: andrew (dot) chapkowski (at) jhu.edu
Office Hours: Online
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Course Description

This course focuses on advanced uses of Python as a scripting tool to automate workflows in GIS and create customized applications. This includes the development of script tools, utilizing advanced ArcPy modules, working with third-party modules, customizing GIS applications, and more advanced Python functionality. Offered once a year. Prerequisites: 430.606 Programming in GIS.

Course Goal

The goal is that each week there will be a geospatial concept along with a fundamental programming concept so students learn both foundational and geospatial programming skills.

Course Objectives

- Learn Python and understand how to use it to solve geospatial problems
- Encourage the use of Python through relevant examples and assignments
- Encourage students implementing it in their own research projects using geospatial technologies.

Textbooks:

- (Required) Kushal Das. **Python for you and me** **THIS IS FREE**

Online Resources:

- **Python documentation**
- **ArcPy documention**

Specific Technology Requirements & Skills for this Course

Learning online requires some basic knowledge of computer technology. At a minimum, you need to be able to:

- User Jupyter Notebooks
- Navigate in and use Blackboard; the Blackboard Student Orientation course on your “My Institution” page
- Open, create, and save Jupyter Notebooks
- Critically Think
- Find basic resources on Internet
- Create and organize files & folders on your computer
- Send, receive, and manage email on your computer

Assessments and Grading Policy

Assignments

Below is a description of the number and type of assignments in this course:

- Computer Assignments: There will be a computer-based assignment every week which will be due every Sunday at 11:59 pm ET. These exercises are designed to provide hands-on experience with programming in GIS
- Projects are student driven projects with guidances in the project pages.
- Discussion Forums: You are required to have at least **1-2** meaningful posting per week on the discussion forums, additional postings and participation are highly advised.

Tentative Course Schedule

Week	Start Date	Topics
Week 1	1/21/2020	Introduction to Python
Week 2	1/27/2020	Introduction to Python
Week 3	2/3/2020	OOP Overview & Python Toolboxes
Week 4	2/10/2020	ArcPy Lesson
Week 5	2/17/2020	ArcPy Lesson
Week 6	2/24/2020	ArcPy Lesson

Week	Start Date	Topics
Week 7	3/2/2020	Arcpy Lesson (Raster data)
Week 8	3/9/2020	**Project 1 Due**
Week 9	3/16/2020	**Spring Break No Class**
Week 10	3/23/2020	Introduction to Data Science
Week 11	3/30/2020	Data Visualization
Week 12	4/6/2020	Python API for ArcGIS 1 of 2
Week 13	4/13/2020	Python API for ArcGIS 2 of 2
Week 14	4/20/2020	Select Advanced Topics in GIS
Week 15	4/27/2020	**Final Project Released**
Week 16	5/4/2020	**Final Project Due**

Assignment Due Dates

Assignment	Date
Lab 1	2/9/2020
Lab 2	2/23/2020
Midterm^	3/8/2020
Lab 3	4/4/2020
Final^	5/10/2020

Note

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^ Midterm opens two weeks before due date
^ Final opens two weeks before due date
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Below is the break down of assignments percentages:

Assignment Weights

Weight	Type
15%	Forum Posting
15%	Labs
35%	Midterm Project
35%	Final Project

Any late assignment will be penalized

Grade Break Down

Weight	Type
98% and 100%	A+
94% and Less Than 98%	A
90% and Less Than 94%	A-
89% and Less Than 90%	B+
84% and Less Than 88%	B
80% and Less Than 84%	B-
70% and Less Than 80%	C
0% and Less Than 70%	F