

Syllabus: Python Programming for ArcGIS

Description

This course will teach you the basics of the [Python 3](https://www.python.org/) programming language and how to use it with [ArcGIS Pro](https://www.esri.com/en-us/arcgis/products/arcgis-pro/overview). If time allows, you will also get an introduction to some open source Python modules that are useful for working with GIS data.

Prerequisites

The course material assumes that you're familiar with GIS concepts, and how to use ArcGIS in particular. You must take Introduction to GIS (NR 6910) before taking this class.

Schedule (subject to change)

1. Install software, test your configuration, and write your first script
2. Introduction to Python
3. Control flow
4. Intro to ArcPy
5. Selection sets
6. Geometries
7. Cursors
8. Rasters
9. Functions and modules
10. Custom ArcGIS tools
11. Map automation
12. Graphing
13. GeoPandas
14. GDAL
15. TBD

Resources

There are no textbooks required for this course, although you can certainly buy one if you'd like. I'll provide you with interactive [Jupyter notebooks](https://jupyter.org/) each week, along with links to relevant material online.

You will be required to install multiple software packages on your computer, starting with (detailed installation instructions to be provided):

- [ArcGIS](https://www.esri.com/en-us/arcgis/products/arcgis-for-student-use)
- [GitHub Desktop](https://desktop.github.com/)

You also need to create a [GitLab.com \(https://about.gitlab.com/\)](https://about.gitlab.com/) account. We'll be using GitLab to disseminate course materials and it's also how you'll turn your homework in.

Requirements

Each student will:

- Turn in completed comprehension exercises for each week (15% of your grade).
- Turn in weekly homework usually consisting of three problems you need to solve with Python code (70% of your grade).
- Do a small project of your own choosing. Ideally this will be something related to your work or another project (15% of your grade).

Evaluation Methods and Criteria

Your homework assignments will be graded on whether or not your code solves the problem correctly and if you followed instructions (for example, if I specify a certain methodology I want you to use and you solve the problem a different way, you won't get credit for that assignment). Always turn in your code even if you didn't finish, because I award partial credit as long as I can tell that you tried (for example, just copy/pasting code examples and turning that in won't cut it). You will lose points for parts of the problem that weren't solved or were solved incorrectly, but you'll receive points for parts of the problem that were completed.

The comprehension questions won't usually award partial credit per question because they're much less involved.

Your project needs to be significantly more involved than a homework assignment, but it doesn't have to be a gigantic undertaking. You'll get a feel for what's possible after we're a few weeks into the course, and I'll want you to talk to me about your project idea before you start.