

## Syllabus: GEOG579C - Intro to Computer Programming - Summer 2017

### **Instructor**

Dr. Jonathan P. Resop ([resop@umd.edu](mailto:resop@umd.edu))

*Office Hours:* On-campus: Mondays, 3 to 5 pm (Also available most days by appointment)

*Location:* 1137 LeFrak Hall

### **Teaching Assistant**

None

### **About the Course**

*Time:* 5:30 to 8 pm Mondays; 5:30 to 7:30 pm Tuesdays

*Location:* Online: <http://elms.umd.edu>; Campus Location: 1171 LeFrak Hall

### **Description**

This course is an introduction to computer programming using the Python programming language. It is recommended for students in the MPSGIS program before they enroll in more advanced programming courses. This course teaches students the fundamental concepts of computer science. Students will learn about the components of a computer program such as data management, conditional statements, iterative statements, and file processing. Students will develop programs the purpose of automating tasks and assisting with data analysis.

The format of this course will consist of lectures, lab assignments, readings, and a final program. The lectures will be presented online via the Live Classroom on the Enterprise Learning Management System (ELMS). All lectures involve the interaction between students and instructor in real-time. Lectures will be archived into videos which will be made available on ELMS. Please note that video archives are intended for occasional or backup use in case students have to miss lectures due to personal, business, or medical reasons. Real-time, online participation is strongly recommended. The reading and lab assignments will also be posted on ELMS.

### **Prerequisites**

There are no direct prerequisites for this class. This class is recommended for all MPSGIS students who have no prior computer programming background as well as those who wish to have additional practice. The skills learned in this class will be useful for more advanced courses such as GEOG656 (Programming and Scripting for GIS), GEOG657 (Web Programming), and GEOG650 (Mobile GIS).

### **Textbooks**

Recommended (only if you are new to programming and need a reference)

- Gries, P., Campbell, J., and Montojo, J. (2013) Practical Programming: An Introduction to Computer Science Using Python, Pragmatic Programmers.

Suggested

- Lutz, M. and Ascher, D. (1999) Learning Python, O'Reilly Media.
- Zelle, J. M. (2003) Python Programming: An Introduction to Computer Science, Franklin Beedle.
- Tucker (2004) Writing Geoprocessing Scripts in ArcGIS, ESRI Press (available online).

### **Online References**

Python Homepage - <http://www.python.org/>; Python 2 Documentation - <https://docs.python.org/2/>

Official Python 2 Tutorial - <https://docs.python.org/2.7/tutorial/>

A Byte of Python (An Online Wikibook) - <https://python.swaroopch.com/>

Additional Python Tutorials - <https://www.learnpython.org/>; <https://www.codecademy.com/learn/python>;  
<https://www.tutorialspoint.com/python/>

### ***Grading***

Students are encouraged to attend each lecture and actively participate in online discussion board as well as in class. Students are required to post a reply on the issues or questions posted by the instructor. Lab assignments will be given on a weekly basis to help students gain practical experience in developing programs with Python. Lab assignments will give students the directions to code sample programs and then ask students to modify programs for solving the given questions. Final grades will be determined by the following items:

Quizzes = 5%

Discussions and Participation = 5%

Lab Assignments = 90%

The plus/minus grading system will be used to assign student grades. Minor adjustments to this scale might be made based on the performance of the class as a whole.

### ***Lab Assignments***

There are a total of six (6) lab assignments and each account for 15% of the final grade. The due date will be specified in the lab document. Late submission of lab reports will result in a possible deduction of points. However, in some situations (e.g. medical or family emergency), extension is possible if you contact the instructor before the due date. All labs must be completed by the end of the quarter.

### ***Software***

You can use either a PC or Mac to access ELMS. Whichever you choose, it should be equipped with headphones and microphone. You should also have the following plug-ins installed: Java, Real Media, Flash Player, and Quicktime.

The following software will be utilized during this course:

- Python 2 (Installed automatically with ArcGIS) (<https://www.python.org/downloads/>)
- IDE (Integrated Development Environment) such as IDLE or Notepad++

The software required for this class is available in the open lab (located in 1136 and 1138 LeFrak Hall) or remotely through VMware (<https://geog.umd.edu/graduate/mps-student-resources>).

### ***Communication***

#### ***Email***

Both the TA and the instructor will always be available by email. Use the email link in the sidebar to send us an email at any time. We will try to answer within 24 hours and usually sooner.

#### ***Online / Chatroom Office Hours***

If needed, I can provide online office hours if you are unable to meet on campus. To do so, simply send me an e-mail to request a time to meet online.

#### ***Offline / On-campus Office Hours***

I will be available to meet on campus for face-to-face office hours at specified times. You can also email the instructor to set up individual office hours by appointment.

### *Discussion Board*

The discussion board is a place on the ELMS site for you to visit your classmates. This is an open forum for discussion about course material and for casual conversation. We encourage any general questions about the course material or lab assignments to be posted here so that students can help learn from each other. We will try to help answer any course-related questions that are posted here. In addition, there will be study rooms set up for you to form study groups. We will not be monitoring these rooms. Remember that the University Code of Academic Integrity specifies that you are free to work together and to discuss the assignments, but that you must produce your own original and independent work.

### *Class Attendance and Environment*

You are strongly recommended to attend every lecture in real time at the online site or on campus at the physical classroom. We will meet online at the announced time for a live audio/video lecture. During this time you can follow along with the lecture and ask any questions that you may have. The lecture will be archived for anyone who absolutely must miss a class, but I encourage you to join the class online at the appointed time so that you can ask questions and keep up with the course schedule.

In this class, students will meet in a virtual space online which will be treated as a classroom. Our class will meet within the Enterprise Learning Management System (ELMS), the university's online learning system. Go to <http://elms.umd.edu> to access the course. After login, the course will be listed in the right column under "My Courses".

It is important to recognize that the classroom is an environment that requires respect for all participants. Therefore, students are expected to conduct themselves in a considerate manner.

### *Disabilities and Religion*

Any student with a disability is encouraged to meet with the instructor privately during the first week of class to discuss accommodations. I will make every effort to accommodate students who are registered with the Disability Support Services (DSS) Office and provide a DSS accommodation form.

Please refer to the Online Undergraduate Catalog Policy on Religious Observance.

### *Academic Integrity*

The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets the standards for academic integrity at Maryland for all undergraduate and graduate students. As a student, you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit <http://www.shc.umd.edu>.

Within our class, students may work together to review class notes and lab assignments. However, labs must be done individually. Students must turn in their own work without assistance from another student.

**Course Schedule**

This is a tentative schedule and may be adjusted. Changes will be announced and posted on Blackboard.

Week	Date	Lecture Topics	Readings	Assignments
1	Jun. 5	Course Overview Introduction to Programming and Scripting Numerical Data Types	Chapter 1, 2	Lab 1 Out
2	Jun. 12	String Data Types Functions, Parameters, and Variables Algorithms	Chapter 3, 4	Lab 1 Due Lab 2 Out
3	Jun. 19	Logical Thinking Conditional Statements Methods and Modules	Chapters 5, 6, 7	Lab 2 Due Lab 3 Out Exercise 1 Out
4	Jun. 26	Data Management and Lists Looping and Iterative Statements	Chapters 8, 9	Lab 3 Due Lab 4 Out
5	Jul. 3	Main Programs File Processing - Reading and Writing	Chapter 10	Lab 4 Due Lab 5 Out Exercise 2 Out
6	Jul. 10	Object-oriented Programming GIS Implications	Chapter 14	Lab 5 Due Lab 6 Out

*Note: Lab assignments are handed out before class and are generally due after one week.*

*All assignments must be submitted online before the end of the course (**Jul. 14**).*

**Lab Assignment Topics**

- Lab 1 - Numerical Data Types and Variables
- Lab 2 - String Data Types and Functions
- Lab 3 - Conditional Statements and Logical Thinking
- Lab 4 - Data Lists and Looping Statements
- Lab 5 - Main Programs and File Processing
- Lab 6 - Object-oriented Programming
- Exercise - Prisoner's Dilemma