UNIVERSITY OF MARYLAND

GEOG646 - Intro to Programming for GIS

Spring 2020

Lecturer:	Rejanne Le Bivic, Ph.D.	**Lecture:**	Mon 5:30p – 8p
Email:	rlebivic@umd.edu		Loc: 1220 Lefrak hall and online
TA:	Hai Lan	**Lab:**	Tue 5:30p – 7:30p
Email:	hlan@terpmail.umd.edu		Loc: Online (ELMS)

Description:

This course is an introduction to computer programming using Python and web programming languages. It is required for students in the MSGIS program before they enroll in more advanced programming courses (GEOG656 and GEOG657). This course teaches students the fundamentals 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 program using scripting languages (Python) and web programming languages (HTML, CSS, JavaScript). Students will develop programs and web apps for automating tasks, assisting with data analysis, and distributing information.

The format of this course will consist of lectures, lab assignments, and quizzes. 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 recommended. The course material will be posted on ELMS.

Prerequisites: There are no direct prerequisites for this class. This class is required for all MSGIS 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).

Main References: There is **no required textbooks**.
Suggested (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.*

Online References (Highly Recommended)

- Official Python 2 Documentation - https://docs.python.org/2/; https://docs.python.org/2.7/tutorial/
- Additional Python Tutorials - https://www.learnpython.org/; https://www.codecademy.com/learn/python; https://www.tutorialspoint.com/python/
- Web Programming Tutorials - https://www.w3schools.com/; https://developer.mozilla.org/en-US/docs/Web; https://www.codecademy.com/learn/introduction-to-javascript

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 and ArcPy. 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 nine (9) lab assignments and each account for 10% 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**.

Quizzes: After each Lecture a Quizz will be posted on ELMS-Canvas. This quiz is meant to make sure you understood the main points of the Lecture. **All the quizzes must be completed by the end of the quarter** and the due date for all the quizzes will be the last day of the quarter. **However** I advise you to complete them after each Lecture because completing them all at the end of the quarter will be more difficult.

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 for Python, Notepad++, Visual Studio Code (https://code.visualstudio.com/Download), or anything you prefer
- FTP software such as WinSCP for PC or Fetch for Mac (http://terpware.umd.edu/)
- All students have a UMD TerpConnect account to upload HTML, CSS, and JavaScript files to your personal web site (http://terpconnect.umd.edu)

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/gis/elms-email-and-software).

Copyright: 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. When refering to, summarizing, paraphrasing or quoting a source, please refer to them properly by adding a reference list to your assignment. Don't copy paragraphs of your sources but rephrase any information that is important for your assignment.

Communication:

Email Both the TA and the lecturer 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.

Offline and Online Office Hours
Lecturer office hours: Mondays from 2pm to 5pm at my office in 2178 Lefrak Hall.
TA's office hours: Tuesdays from 10:30am to 12:30pm in the TA's office in Lefrak 1113.
You can also email either the TA or the instructor to set up individual office hours by appointment. If needed, the lecturer 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.

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. If needed and upon request, 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.

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.

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** - Modular Programming and File Processing
- **Lab 6** - Basic HTML and CSS
- **Lab 7** - Web Page Layouts using HTML and CSS
- **Lab 8** - JavaScript Programming
- **Lab 9** - HTML Forms using JavaScript

All work must be submitted by May 18th Final grades must be submitted to the university by May 20th.

Course Schedule This schedule may be adjusted. Changes will be announced and posted on ELMS.

Week #	Lecture #	Lecture date	Lab #	Lab date	Lab due	Lecture topics
1	1	3/2	1	3/3	3/13	Course Overview Intro to Python Programming Numerical Data Types
2	2	3/9	2	3/10	3/20	Python Programming: String Data Types Functions, Parameters and Variables
Spring Break						
Classes Cancelled						
3	3	3/30	3	3/31	4/10	Python Programming: Logical Thinking and Conditional Statements Modules and Methods
4	4	4/6	4	4/7	4/17	Python Programming: Data Management and Lists Looping and Iterative Statements
5	5	4/13	5	4/14	4/24	Python Programming: Main Programs and Modular Programming File Processing - Reading and Writing Files
6	6	4/20	6	4/21	5/1	Introduction to Web Programming: Markup Languages - HTML and XHTML Style Languages - CSS
7	7	4/27	7	4/28	5/8	Web Programming: Web App Layouts HTML and CSS
8	8	5/4	8	5/5	5/15	Web Programming: Introduction to JavaScript Variables, Data Types, Functions
9	9	5/11	9	5/12	5/18	Web Programming: Web App Forms - Styling HTML Forms with CSS JavaScript Event Handling
10	10	5/18	-	-	-	Python Error Handling JavaScript DOM Manipulation