University of Maryland at College Park
Department of Geographical Sciences
GEOG 676: Advanced Programming for Geography and Remote Sensing
Spring 2018

Instructor: Dr. Louis Giglio
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General Course Information
This course provides comprehensive instruction in the use of IDL ("Interactive Data Language"), a commercial programming language and analysis tool widely used for scientific programming and data visualization, with an emphasis on applications in geography and remote sensing.

Course Prerequisites
GEOG 376 (*Introduction to Computer Programming for GIS*) or a basic proficiency in any contemporary programming language.

Schedule
Class meets from 4:30 - 7:00 pm each Tuesday in LeFrak 1171. Each class will consist of a review of the previous week's homework assignment, a lecture, a short break, and either a classroom demonstration or a lab session in the Open Laboratory in LeFrak 1138/1139.

Office Hours
Monday 1:00 pm - 3:00 pm, and by appointment.

Course Materials
No textbook is required for this course. Course materials will be distributed in class and posted on the University of Maryland Enterprise Learning Management System (ELMS) course Canvas (https://elms.umd.edu). All students enrolled in the course have access to this system.

Course Requirements
Students will be assigned 11–12 homework assignments. Each assignment is due in class the week (occasionally two weeks) after it is assigned. Late assignments will be given a 50% grade reduction, except in the case of excused absences or emergencies.

Grading
Homework (90% of final grade) and class participation (10% of final grade).

Group Work
You are permitted to work together on the assigned problem sets, but please do not share completed code or solutions. In other words, do not allow others to simply copy your work.

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 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 see the Student Honor Council web site.[1]

Schedule

#	Date	Lecture/Lab Topic
1	1/30	Course overview; IDL data types and type conversions; introduction to arrays; arithmetic, relational, and Boolean operators; journaling.
2	2/6	Procedures and functions; parameters and keywords; control statements; common blocks.
3	2/13	Array manipulation, properties, searching, and advanced indexing. Structures.
4	2/20	System variables, manipulating strings. I/O: standard input and output, working with files, reading and writing ASCII files, reading and writing binary files; IDL save files.
5	2/28	Direct graphics vs. function graphics; plotting.
6	3/6	I/O: HDF, GeoTIFF, and other specialized data formats; working with MODIS, VIIRS, and Landsat data.
7	3/13	Mapping; floating-point considerations and special values.
	3/20	*No class (spring break).*
8	3/27	Pointers, efficient programming, and error handling.
9	4/3	Probability and statistics.
10	4/10	*No class (AAG meeting).*
10	4/17	Time series analysis.
11	4/24	Image processing.
12	5/1	Interpolation and advanced mathematics.
13	5/8	Lists and hashes, IDL virtual machine, GDL.

[1] http://www.studenthonorcouncil.umd.edu/whatis.html