Syllabus for GEOG653

Instructor

Name: Jianguo (Jack) Ma, Ph.D.
Office: LeFrak2181
Email: jma3@umd.edu
Phone: (301) 405-3861
Office Hours: Mondays (3:00pm-5:00pm)
(Additional office hours can be scheduled by appointment via email or phone.)

Teaching Assistant

Name: Tayla Gulman
Email: talyac@umd.edu
Office Hours: TBA

About the Course

Time:

- Lecture: 5:30 PM - 8:00 PM, Mondays (The first lecture is on 09/02/2014, Tuesday)
- Lab Section#1: 5:30 PM - 6:30 PM, Tuesdays

Location:

- Class room for Lectures: Lefrak Hall 1124
- Online - http://elms.umd.edu

Description

This course is designed to help student develop a comprehensive and systematic understanding of spatial analysis methods and learn practical skills in using GIS and spatial analysis to discover features of spatial distribution. The class covers the methods of spatial analysis including measuring aspects of geometric features and identifying spatial patterns of geospatial objects that are represented as point, line, network, areal data, and 3-D surfaces. The material will be presented in readings, lectures, lab assignments, and final projects.

Textbooks

There is one required textbook for the course:

1. Mitchell, Andy. The ESRI Guide to GIS Analysis, Volume 2. ESRI Press, 2005. ISBN: 978-1-58948-116-9. This book is available in the UMD bookstore or can be purchased from www.esri.com.

Should you have time and interest, an optional book can be used for your reference:

2. Longley, Paul A., Michael F. Goodchild. Geographic Information Systems and Science. John Wiley & Sons, 2005. ISBN: 047087001X.

Assignments

There are totally seven (7) lab assignments to be completed. Each of these lab assignments will count 10% of the final grade. Lab reports are due by the date specified in the Course Schedule. Late submission of lab reports will result in a reduction of the grade for that assignment of 10 points (out of 100 in total) per day. However, in some rare situations (e.g. medical or family emergency), if you need extra time, you will have to contact the instructor before the due date so that the deadline may be extended.

Course Communication

All students are required to have a GLUE account and a UMD email address. We will frequently use email for communication in the class and we will **only** use UMD email addresses. Be sure that the email address on TESTUDO is your UMD account. Each student will also need permissions to the OpenLab. Instructions for getting these accounts will be given at orientation and on the first day of class.

Assignments, announcements, data sets, etc. will be made available to registered students via Blackboard: http://elms.umd.edu. You are strongly recommended to log in Blackboard and check the announcements regularly (at least once a day). You also need to check your UMD email account often so that you will get all the information sent to the class.

Final Project

Because this course is designed to be practical emphasizing on GIS analysis, a final project is considered a better option compared to a final exam. This will allow students spend more time focusing on how to use GIS as a tool in their study/research/work.

A written proposal of research (>=2 pages) must be submitted in class by the date specified in the Course Schedule. The proposal should: (1) identify research problem; (2) provide background information; (3) list objectives; and (4) describe data and methods. Students are encouraged to contact the instructor early during the semester to discuss potential topics and scope. This proposal will be worth 5% of your final grade

The project must be carried out individually and independently. This project should be limited in scope and designed for completion during the semester. Students are required to report their research project in a poster format. The poster must be submitted by the deadline and it will account for 22% of your final grade.

Grading

The distributions of grade are:

Lab Assignments	=	70%
Final Project	=	27%
Discussion/Participation	=	3 %

The plus/minus grading system will be used to assign student grades which will be determined as follows:

97-100 = A+
93-96.99 = A
90-92.99 = A-
87-89.99 = B+
83-86.99 = B
80-82.99 = B-
77-79.99 = C+
73-76.99 = C
70-72.99 = C-
67-69.99 = D+
63-66.99 = D
60-62.99 = D-
<60 = F

Minor adjustments to this scale might be made based on the performance of the class as a whole.

Course Schedule

Week	Date	Lecture Topics**	Readings	Assignments
1	Sep 2*	Course Overview Introduction to Spatial Analysis Demonstrations and Examples	Lecture Slides	Exercise 1,2,3
2	Sep 8	Fundamental Spatial Analysis – Spatial Query – Spatial Join – Overlay Operations – Buffering ModelBuilder	Mitchell 1-20	Lab 1 out Exercise 4
3	Sep 15	Point Pattern Analysis –Geometric Measurements –Quadrat Count Analysis –Kernel Density Analysis –Nearest Neighbor Analysis	Mitchell 21-50, 80-103, 135-145, 147-162	Lab 1 due Lab 2 out Exercise 5
4	Sep 22	Line Data Analysis –Line Length –Line Density –Line Direction -Line Orientation	Mitchell 51-60	Lab 2 due Lab 3 out Exercise 6
5	Sep 29	Network Analysis –Routing –Service Area –Closest Facilities –O-D Cost Matrix	Lecture Slides	Lab 3 due Lab 4 out Exercise 7
6	Oct 6	Areal Analysis –Spatial Autocorrelation –Joint Count	Mitchell 104-132, 163-180	Lab 4 due Lab 5 out Exercise 8
7	Oct 13	Surface Analysis –Spatial Interpolation –Distance Analysis –Density Analysis –Surface Analysis Operations	Lecture Slides	Lab 5 due Lab 6 out Exercise 9
8	Oct 20	3D Analysis - Draping - Extrusion - Line-of-Sight - Viewshed - Skylines - Volumetric Analysis - Animation	Lecture Slides	Lab 6 due Lab 7 out Final project proposal due Exercise 10

9	Oct 27	Other Topics - GeoDa - XTools - Hawth's Analysis Tools (Geospatial Modelling Environment)	Lecture Slides	Lab 7 due Exercise11
10	Nov. 3	New Development in GIS Summary		Final project due on Nov 7

Note:

* - The lectures are on Mondays and the lab sessions are on Tuesdays. However, since Sept. 1st is the Labor Day and no class is allowed for this day, we will move the first lecture to Sept. 2nd (Tuesday).

** - Besides lectures, there will be lab sessions which may cover a variety of topics depending on the interests and needs from students, e.g. geodesy, model builder, raster data management, geocoding, geo-referencing, etc.

This is a tentative schedule and may be adjusted to suit our class.