Syllabus: GEOG653 - GIS and Spatial Analysis - Spring 2014

Instructor
Name: Dr. Jonathan P. Resop
Email: resop@umd.edu
Office: 2178 LaFrak Hall
Office Hours: On-campus: Wednesdays, 3 to 5 pm
(Also available most days by appointment)

Teaching Assistant
Name: Sumalika Biswas
Email: sbiswas2@umd.edu
Office Hours: TBA

About the Course

Time:

- Lectures: 5:30 to 8:00 pm, Mondays
- Lab Sessions: 5:30 to 6:30 pm, Tuesdays

Location:

- Campus Location: TBA Lefrak Hall
- Online: http://elms.umd.edu

Description

This course is designed to help students 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 points, lines, networks, areal data, and 3-D surfaces. The material will be presented in readings, lectures, lab assignments, and a final project.

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, these optional books can be useful references:

2. Longley, Paul A., Michael F. Goodchild. Geographic Information Systems and Science. John Wiley & Sons, 2010. ISBN: 047087001X.
3. O'Sullivan, D. and D. Unwin. Geographic Information Analysis. John Wiley & Sons, 2003.

Lab Assignments

There are totally seven (7) lab assignments to be completed. Each lab assignment will count toward 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 situations (e.g. medical or family emergency) where you need extra time, you will have to contact the instructor before the due date so that the deadline may be extended.

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 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 quarter. Students are required to report their research project in a poster format and present their work online during the last week of class. The poster must be submitted by the deadline (end of the quarter). The presentation and poster will account for 20% of your final grade.

Grading

The distributions of grade are:

Lab Assignments = 70%
Final Project = 25%
Course Participation (Discussion and Quizzes) = 5%

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.

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

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. ESRI ArcGIS 10.X will be used for the majority of the labs. The software required for this class is which is available in the open lab (located in 1136 and 1138 LeFrak Hall) or on the Citrix server (http://geogwi.umd.edu/). Note: The free software that comes in books and other venues does not have the ArcInfo license and cannot be used to complete most labs. If you need a copy of ESRI ArcGIS please let me know.

Communication

Email

Both the TA and the instructor will always be available by email or ELMS messaging. Use the message link 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 either the TA or 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. 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	Mar. 3	Course Overview Introduction to Spatial Analysis Demonstrations and Examples	Lecture Slides	Exercises 1, 2
2	Mar. 10	Fundamental Spatial Analysis (Spatial Query, Spatial Join, Overlay Operations, Buffering)	Mitchell 1-20	Lab 1 Out Exercises 3, 4
	Mar. 17	Spring Break		
3	Mar. 24	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
4	Mar. 31	Line Data Analysis (Line Length, Line Density, Line Direction, Line Orientation)	Mitchell 51-60	Lab 2 Due Lab 3 Out
5	Apr. 7	Network Analysis (Routing, Service Area, Closest Facilities, O-D Cost Matrix)	Lecture Slides	Lab 3 Due Lab 4 Out Proposal Due Exercise 5
6	Apr. 14	Areal Analysis (Spatial Autocorrelation, Joint Count)	Mitchell 104-132, 163-180	Lab 4 Due Lab 5 Out Exercise 6
7	Apr. 21	Surface Analysis (Spatial Interpolation, Distance Analysis, Density Analysis, Surface Analysis Operations)	Lecture Slides	Lab 5 Due Lab 6 Out Exercise 7
8	Apr. 28	3-D Analysis (Draping, Extrusion, Line-of-Sight, Viewshed, Skylines, Volumetric Analysis, Animation)	Lecture Slides	Lab 6 Due Lab 7 Out Exercise 8
9	May 5	Other Spatial Analysis Topics (GeoDa, XTools, Hawth's Analysis Tools, Other Tools and Extensions)	Lecture Slides	Lab 7 Due Exercise 9
10	May 12	Final Project Presentations New Developments in GIS		Project Due by **May 16**