Geography 373, Spring 2015 University of Maryland College Park

Introduction to Geographic Information Systems

Lecture: Tuesday 12:30-2:20pm, 2166 LeFrak Hall

Lab: Thursday 1-2:50pm (0101), Wed. 9-10:50am (0102), Thursday 9-10:50am (0103), 1138 LeFrak Hall

Instructor: Naijun Zhou, Ph.D.
Office hours: Monday 12-1:30pm, Tuesday 11am-12pm, or by appointment, 1125 LeFrak
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Teaching Assistant (***please contact the TA of your section for questions***):
Section 0101: wsgong@umd.edu,
office hours: Tuesday 9:30-11:30am, 1113 LeFrak
Section 0102: Robbie Greenebaum, rgreeneb@umd.edu,
office hours: Monday 2-4pm, 1113 LeFrak
Section 0103: Yanjia Cao, yanjiac@umd.edu,
office hours: Tuesday 9-11am, 2132 LeFrak

Course Website: ELMS (http://elms.umd.edu)

Course Objectives

Geographic Information System (GIS) is widely recognized and used in almost every subject. In 2003, GIS (together with Remote Sensing and other geotechnologies), Nanotechnology and Biotechnology have been defined by the U.S. Department of Labor as three most important emerging and evolving fields.

The course will introduce fundamental concepts and skills of geographic information systems (GIS) including digital representation, GIS data manipulation and management, and basic spatial analyses. Students will develop an understanding of 1) GIS data models including vector and raster data, 2) map projections, coordinate systems, 3) computer cartography, 4) geodatabases, 5) data collection, transformation and quality, 6) basic GIS analyses, 7) GIS project management, and some cutting-edge technologies.

Labs are designed to provide hands-on experiences of using leading GIS software, ArcGIS Desktop 10.2, to collect, manage and analyze geospatial data. This course is for all students who want to learn fundamentals of GIS and develop basic geospatial data manipulation skills. The course can serve either as a termination for a more general program or as a gateway to 400 level classes in Geography, especially Geog473 (GIS and Spatial Analysis) and Geog475 (Computer Cartography).

Prerequisites

None. However, basic computer and quantitative skills are strongly recommended.

Textbooks

No required textbooks. The following books are highly recommended and can be checked out at library:

- Michael N. DeMers, 2009. *Fundamentals of Geographic Information Systems*, 4th edition. Hoboken, NJ: Wiley. Call number: G70.212 .D46 2009.
- Lo, C. P., Yeung, Albert, 2007. *Concepts and techniques of geographic information systems*, 2nd edition. Upper Saddle River, NJ: Pearson Prentice Hall. Call number: G70.212 .L627 2007.

- Longley, Paul, et al., 2005. *Geographical Information Systems and Science*, 2nd edition. Chichester: Wiley. Call number: G70.212 .G44553 2005.
- Andy Mitchell, 1999. *The ESRI Guide to GIS Analysis Volume 1: Geographic Patterns & Relationships*. ESRI Press. ISBN: 1879102064. Call number: G70.212. M58 1999.

Lecture and Lab Schedule, and Due Dates

Week	Date	Lecture	Lab and Due Date
1	9/1	Introduction to GIS	
	9/2,3		Lab 1: Introduction to ArcGIS
2	9/8	Data Models: Vector and Raster	
	9/9,10		NO LAB
3	9/15	**Homework 1 Due: 9/15 on ELMS** Map Projections, Coordinate Systems	
	9/16,17		Lab 2: Projections, Coordinate Systems
4	9/22	Data Collection	
	9/23,24		NO LAB
5	9/29	**Homework 2 Due: 9/29 on ELMS** Data Collection: Digitizing	
	9/30,10/1		Lab 3: Data collection
6	10/6	Data Quality and Standards	
	10/7,8		NO LAB
7	**10/13**	**Homework 3 Due: 10/13 on ELMS** **EXAM I: 12:30-2pm, 2166 LEF**	
	10/14,15		NO LAB
8	10/20	Data Storage: Geodatabases	
	10/21,22		Lab 4: Geodatabases
9	10/27	Geovisualization	
	10/28,29		**Homework 4 Due: 10/28 or 10/29 on ELMS** Lab 5: Computer Cartography
10	11/3	Spatial Analysis I	
	11/4,5		**Homework 5 Due: 11/4 or 11/5 on ELMS** Lab 6: Spatial Analysis
11	11/10	Spatial Analysis II	
	11/11,12		NO LAB
12	11/17	Raster Analysis	
	11/18,19		**Homework 6 Due: 11/18 or 11/19 on ELMS** Lab 7: Raster Analysis
13	11/24	Advanced Topics	
	11/25,26		**Homework 7 Due: 11/25 on ELMS** NO LAB. Thanksgiving.
14	12/1	GIS Project Management	**Take Home Practical Exam distributed: 12/1**
	12/2,3		NO LAB **Take Home Practical Exam due: 12/8 on ELMS**
15	12/8	Conclusion; Review	
	12/9,10		NO LAB
16	**TBA**	**Exam II**	

Notes:
1) Date of Exam II will not be assigned by the University until mid-semester.
2) Electronic homework assignments are due on ELMS. See the homework for details.

Course Requirements and Important Information

- **SEVEN** homework assignments. A digital copy of completed homework (Word file) must be submitted on ELMS by the due date and time. Check ELMS for submission link for each homework. Each homework assignment will include lab exercise result and/or discussion questions.
- **TWO** in-class, non accumulative, close-book, close-note exams. The exams include the materials covered in lectures. The exam format is a combination of short answers and multiple choice questions.

- **ONE** take home practical exam, which will use all the ArcGIS skills learned in the semester to solve a real-world problem.
- **Attendance** at all lectures and labs is mandatory. Lab and lecture absences, late work and make-up exams are given for University approved excused absences, and students must notify the TA and/or the Instructor and make arrangement at least **24 hours BEFORE** the due date. Students also need to provide valid documents for absence, late work and make-ups. Otherwise, no late work and make-ups will be accepted. In addition, if it is found that one has falsified the documentation provided, the instructor will refer to the University's Student Conduct Office.
- The instructor will make every effort to accommodate students who are registered with the Disability Support Services (DSS) Office and who provide the instructor with a University of Maryland DSS Accommodation form. This form must be presented to the instructor no later than September 14, 2015.
- All materials including lecture slides, announcements, lab instructions & data, homeworks are posted on **ELMS**. Check ELMS frequently.
- **E-mail**: for efficient communication, please put the class name (i.e., GEOG373) and your full name in your email subject. **Please contact the instructor and the TAs' with the email addresses (given in the first section of this syllabus) in stead of ELMS message.**
- **COMMUNICATE**! Feel free and do not hesitate to contact the instructor and the TA if you have any concerns, critiques and suggestions. They are ALWAYS welcome, and the earlier the better.

Grading

My baseline grade for the course, which assumes that you complete the work in good faith, on time, with serious effort, and with a certain degree of success, is "B." To do better, you need to give something extra; to do worse, you need to give something less. The numeric points of student's work are evaluated as:

Assignment Type	Number of Assignments	Points Per Assignment	Total Points (sum to 100)
Homework 1, 2, 3, 4, 5, 6, 7	7	6	42
Exam I, II	2	20	40
Take home practical exam	1	15	15
Lab attendance (taken for every lab)	7	N/A	3

The final letter grade is based on the calculated numeric points in the table, and will be graded as (with variations): A: 85.0-100, B: 75.0-84.9, C: 60.0-74.9, D: 50.0-59.9, F: <50.0

Academic Honesty

The University of Maryland has a Code of Academic Integrity that all students are expected adhere to. Please see http://www.studenthonorcouncil.umd.edu/index.html for specific information. Within our class, students may work together on homework assignments, however, each student absolutely must turn in their own work, from their own computer, and any discussion must be theirs alone, and not attributable to another person or group. Students may not use any textual discussion, calculations or programs from any other student or group of students.