University of Cincinnati[1]
Geography 580: Introduction to Geographic Information Systems, Fall, 2007
T H 9:30 am – 10:45 am, Swift Hall 619
(with labs in Braunstein Hall 406 and 415)

Professor: Lin Liu, Ph.D.
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Mr. Yu Sun: suny4@email.uc.edu
Office hours: Monday 2:00 pm - 5:00 pm
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Lab Hours: The computer laboratories in Braunstein Hall 415 and 406 are usually open during the work hours. If you need access to the labs in weekend or evening, please check out a key from the secretary of Geography Department in Braunstein Hall 401. No food/drink in the lab!

Required Materials:
DeMers, Michael N. 2005. *Fundamentals of Geographic Information Systems*. The 3rd edition. John Wiley & Sons, Inc. Available at UC Bookstores. 2nd edition (updated) is also acceptable.
Liu, Lin. 2007. *Lecture Notes for Introduction to GIS* (http://blackboard.uc.edu/).
A USB drive for submission of assignments.

Course Description:
The fundamental objective of this course is to introduce the theories and applications of Geographic Information Systems (GIS). The basic topics include definition of GIS, the history of GIS, topological data structure, data preprocessing, data manipulation and analysis, geographic modeling with GIS, and the future of GIS. The focus of this course is spatial analysis. ArcGIS, including the Spatial Analyst and Network Analyst extensions, will be used as the primary software package in the laboratory.

Course Evaluation:
There are one midterm and one final examination (not comprehensive). Each of the two exams counts for 350 points. The exams cover materials from lectures, exercises and assignments.

Students will typically work on TA led exercises during the lab hours. In addition, there will also be three graded assignments, each worth 100 points. Assignments are generally due in one week (due dates will be posted on each assignment), and they are due at the beginning of the lab period. You are required to complete the assignments on your own! This is necessary to assure that the grade you receive is your own and not your partner's. The total for the course is 1000 points (350*2 + 100 * 3 = 1000). The final grade is determined by natural breaks on the curve of accumulated scores. Undergraduate students are graded using a separate curve.

Attendance is required for both lectures and labs. Penalties may be assessed for unexcused absence. Make-up exams will not be given unless under special conditions that must be documented. Late assignments are subject to penalty:

[1] Disclaimer: The professor reserves the right to modify this syllabus.

Number of days late	Percentage of points taken off
1	20%
2	40%
3	60%
4	80%
>=5	100%

I do not assign "I", "N", or "IP" grades, except under rare and special circumstances that must be documented. Those who audit the course must attend all classes and complete all exercises/labs/assignments to receive a "T" grade.

Important Dates:

Midterm: TBD, in week five or six
Final exam: Thurs, Dec. 6, 8-10 am, in the classroom.

Tentative Course Schedule:

Week	Topic
1	Course mechanics, introduction, GIS definition, essential elements of GIS
2	Definition of spatial objects, cartographic concepts, map projection and coordinate systems
3	Vector data structure
4	Analysis of vector data
5	Geo-coding and address matching
6	Raster data structure
7	Analysis of raster data
8	Data acquisition and preprocessing
9	GIS modeling, GIS design and implementation
10	History and future direction of GIS, GIS Research

Reading List:

Topic	Book by DeMers, 3rd edition	Book by DeMers, 2nd edition (updated)
What is GIS? Spatial Objects, Spatial Analysis	Chapter 1 Chapter 2	Chapter 1 Chapter 2
Cartographic Concepts, Map Projection and Coordinate System	Chapter 3	Chapter 3
Data Model Vector Data Structure	Chapter 4 (72-85) Chapter 4 (95-101)	Chapter 4 (99-111) Chapter 4 (124-135)
Vector Data Analysis	Chapters 11, 12, 7, 8 (195-208), 9 (232-237)	Chapters 11, 12, 7, 8 (261-275), 9 (309-314)
Raster Data Structure	Chapter 4 (89-95)	Chapter 4 (116-124)
Raster Data Analysis	Chapters 9 (221-232), 10, 8 (209-217)	Chapters 9 (297-314), 10, 8 (276-284)
Modeling & Applications	Chapter 13	Chapter 13
Data Acquisition & Preprocessing	Chapter 5, 6	Chapter 5, 6
Database, GIS Design and Implementation	Chapter 15	Chapter 15
History & Future of GIS, GIS Research	Lecture Notes, Chapter 17	Lecture Notes