

GEOG 4500/5500 – Introduction to Geographic Information Systems

ENV 336 (CSAM), MTWR 2:00-3:50 pm, Summer II, 2003

Instructor: Dr. Minhe Ji
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Objectives

Introduce the basic concepts and practical skills of Geographic Information Systems (GIS). Topics include digital representation of geographic objects, procedure of GIS projects, data input and manipulation, map projection and coordinate systems, data management and analysis, and mapping and presentation of geographic information. After this course, students are expected to have had basic understanding of what GIS can do, how GIS can be used to approach geographic problems in different applications, and some hands-on experience of using GIS for geographical visualization and analysis.

Required Texts and Other Materials

- (1) Chang, Kang-tsung, 2002, *Introduction to Geographic Information Systems*, McGraw-Hill Companies, Inc. ISBN 0-07-238211-2.
- (2) ESRI Digital Books (provided by the instructor - see the end of this syllabus for details).
- (3) Two blank CD RW discs (Note: Must be re-writable. Not write-once-read-many).

Attendance Policy

Regular class attendance is the key to success in this course. Students are expected to attend every meeting of this course. Although absence has no direct relation to your grade, its effects will immediately show in your understanding of course materials and lab assignments. Majority of questions in the exams will also come from the lectures and labs. If you did miss a class, you should borrow a fellow student's notes and check the online lecture presentation files. I will be happy to answer questions about the missed material during my office hours.

Grading Policy

Evaluation consists of 5 labs (50%) and 2 exams (50%). Final grades strictly follow 60-70-80-90 breakdowns. Labs are due one week from the handout date. Late labs are accepted with a 10 percent per day deduction.

DSA

Any Student who, because of a disabling condition, requires special arrangements in order to meet the course requirements should contact the instructor before the 4th class period of this semester to make necessary accommodations.

Course Outline

DATE	TOPIC	READING / LAB
1. Maps and GIS Data Display		
7/07	Course introduction. Maps and their digital representation	C1, B1-2, M1-3, Lab1
7/08	Map feature symbolization and labeling	C8.1-8.4, M6-7
7/09	Quantitative classification	C9.6, M6
7/10	Data standardization for geographical visualization	M6-7
2. GIS Data Formats, Input, and Storage		
7/14	Procedure of a GIS project. Internal data formats of a GIS	B3-5, C3, Lab2
7/15	External data sources and data conversion	C4.1-4.4, B6
7/16	Edit existing map features and their topologic relations	C5, S3, S7-10
7/17	Create your own GIS datasets	C4.5, S4, S6, M15
3. GIS Data Manipulation		
7/21	Map projection and coordinate transformation	C2, K1-4, B6, Lab3
7/22	Midterm Exam	
7/23	GIS data layer merging and clipping	C5.5, B6
7/24	Attribute tables, table join and relate	C6, M10
4. GIS Database Query and Spatial Analysis		
7/28	Attribute query	C9.3.1, M13, Lab4
7/29	Spatial query	C9.3.2, M13, B7
7/30	Overlay analysis	C10.3, B7, M13
7/31	Proximity analysis	C10.2, B7, M13
5. Preparation and Presentation of GIS Analytic Results		
8/04	Post-overlay processing and report making	B4-8, M11-12, Lab5
8/05	Map design for professional presentation	C8.5-8.6, M8
8/06	GIS careers and job prospect	
8/07	(No class - Finishing up your homework assignments)	
8/08	Final Exam	

Note: In the Reading / Lab column, C stands for the main textbook, B, for the digital book of *Getting Started with ArcGIS*, M, for the digital book of *Using ArcMap*, K, for the digital book of *Understanding Map Projections*, and S, for the digital book of *Editing in ArcMap*.

- **List of ESRI digital books for this course**

1. What_is_ArcGIS.pdf
2. Getting_Started_with_ArcGIS.pdf * (B)
3. Editing_in_ArcMap.pdf * (S)
4. Using_ArcCatalog.pdf
5. Using_ArcMap.pdf * (M)
6. Using_ArcToolbox.pdf
7. Understanding_Map_Projections.pdf * (K)

* Required reading and exercise materials

All these digital books are available in R:\CSAM\class\4500\DigitalBooks.

*** Note: Printing digital books or the ArcGIS desktop online helps in the CSAM (stands for Center for Spatial Analysis and Mapping) lab is strictly forbidden. If you need a hardcopy of these materials, please print them elsewhere.

- **Lecture notes (PowerPoint files) are available in R:\CSAM\class\4500\Summer03_Notes**