

University of Cincinnati
Geography 581: GIS Modeling and Environmental Applications
Winter, 1998 T TH 2:00 - 3:15 Swift Hall 706

Professor: Lin Liu, Ph.D.
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Office: Swift Hall 700
Phone: 556-3433
Office hours: T 3:15 – 5:15 pm

Lab Hours: The lab is usually open during the work hours. If you need access to the lab in weekend or evening, please check out a key for the lab from the secretary of Geography Department in Swift Hall 714.

Course Materials:

- 1) ESRI, 1996. *Working with the ArcView Spatial Analyst*. Can only be purchased through ESRI's authorized instructors.
- 2) ESRI, 1996. *Using the ArcView Spatial Analyst*. Available to general public.
- 3) Tomlin, C. Dana. 1990. *Geographic Information Systems and Cartographic Modeling*. Prentice-Hall.
- 4) Check <http://www.esri.com/base/events/uc/index.html> for Proceedings of ESRI User Conference '95, '96 and '97 under the title Environmental and Natural Resources.
- 5) A list of additional readings is available from the instructor.

Course Description:

The fundamental objective of this course is to introduce GIS modeling and its applications to environmental studies. The basic topics include grid data structure, grid data sources, database issues, surface analysis, hydrological analysis, map algebra, editing and registration, modeling and suitability analysis. In addition, some real-world applications will also be discussed.

There are two classes each week. The first is for lecture while the second is usually for laboratory. Spatial Analyst, an extension for raster modeling of ArcView, will be used as the primary software package in the laboratory.

To get exposed with various real-world GIS applications, students are strongly recommended to read articles described above in items 4 and 5.

Course Evaluation:

Attendance is strictly enforced in this course. Absence of class will result in penalty at the instructor's discretion.

There will be eight in-class laboratory exercises, which are not graded. Successful completion of eight exercises counts for 300 points. Each lab will be evaluated at the end of the lab session.

There will be a midterm and a final examination. Each of the two exams counts for 350 points. The exams will cover materials from both lectures and laboratory exercises, and they consist of true/false questions, multiple choice questions and short answer questions. The final exam is not comprehensive.

The total for the course is 1000 points. Your final grade will be determined on the following basis:

<u>Accumulated points</u>	<u>Grade</u>
≥ 900	A
≥ 800 & < 900	B
≥ 700 & < 800	C
≥ 600 & < 700	D
< 600	Fail

Make-up exams will not be given unless under special conditions that must be documented.

Important Dates:

Midterm will be held on Thursday of the fifth week, February 5, 2:00-3:15pm in Swift Hall 706.

Final exam will be held on Thursday, March 19, 1:30-3:30pm in Swift Hall 706.

Course Dropping Deadlines:

According to University's policy, the appropriate deadlines are:

- For adding, changing from credit to audit: through the seventh calendar day of the quarter.
- For dropping (with no transcript entry or faculty signature): through the twenty-first calendar day of the quarter.
- Dropping (with a "W" or "F" and the instructor's signature): through the fifty-eighth calendar day of the quarter. If, in the instructor's judgement, the student is passing at the time he or she seeks withdraw, a grade of "W" will be assigned. If, in the instructor's judgement, the student is failing at the time he or she seeks to withdraw, a grade of "F" may be assigned.

Tentative Course Schedule:

<u>Week</u>	<u>Topic</u>
1	Course mechanics, introduction to Spatial Analyst, and grid themes
2	grid data structure, grid data sources, and database issues
3	Introduction to map algebra
4	Map algebra (continued)
5	Distance operations
6	Surface and hydrology analysis
7	Editing and registration
8	Modeling and suitability analysis
9	Real-world applications
10	Real-world applications (continued)

Assignments:

<u>Week</u>	<u>Topic</u>
1	Introduction to Spatial Analyst and explore grid themes
2	Grid theme storage and grid theme analysis
3	Map algebra and map calculator (I)
4	Map algebra (II)
5	Midterm
6	Shortest distance
7	Surface and hydrology analysis
8	Editing and registration of grid themes
9	Modeling and suitability analysis
10	Demo of real-world applications