University of Cincinnati
Geography 582: GIS Urban & Economic Applications
Winter, 2008
T H 11:00am -12:20 pm Braunstein Hall 415

**Professor:**
Lin Liu, Ph.D.
Braunstein Hall 400E
Phone: 556-3429
Office hours: T H 9:30-11:00, and by appointment
Email: lin.liu@uc.edu
http://www.geography.uc.edu/~linliu

**TA:**
Paul (Yin) Liu: ly3@email.uc.edu
Office: Braunstein Hall 416
Phone: 556-3433
Office hours: TBD

**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 Braunstein Hall 401. **When you open the door, make sure that the door can be locked without a key. Lock the door when you are the last one to leave at any time.**

**Required Materials:**
1. *Required Readings*, available from the instructor.
2. One USB drive for labs and assignments.

**Optional Materials:**

Disclaimer: The professor reserves the right to modify this syllabus.
**Course Description:**

The fundamental objective of this course is to introduce the theories and applications of Geographic Information Systems (GIS) to problems in urban/economic geography. The basic topics include topological data structure (TIGER and DLG data), spatial analyses and GIS, Urban environment and environmental equity, network analysis, retail site location, service area delineation, geodemographics and marketing, retail planning, urban transportation and crime analysis, urban planning, land records information and map updating, the design and implementation of urban/economic GIS applications.

The pre-requisite of this course is Geography 580: Introduction to GIS. Thorough knowledge of ArcGIS is required. Students are expected to be able to use on-line help to run ArcGIS independently. Basic knowledge on statistics is also required.

Each week has two classes: one for lecture and the other for laboratory. ArcGIS and its extensions for spatial analysis and network analysis will be used as the primary software packages in the laboratory.

**Course Evaluation and Grading Policy:**

There are five graded assignments (80 points each), and eight to ten non-graded laboratory exercises. Graded assignments are generally due in one week (due dates will be posted on each lab), and they are due at the beginning of the laboratory period. The majority of laboratory time is for non-graded laboratory exercises designed to teach you what you need to know for each graded assignment. For these exercises you may work as teams to learn the concepts. You are required to perform the graded assignments on your own! This is necessary to assure that the grade you receive is your own and not your partner's.

There are two exams (300 points each), which cover materials from lectures, required readings, labs and assignments.

The total for the course is 1000 points \((80*5 + 300*2 = 1000\)). Final grade is determined by the natural breaks on the curve of accumulated scores. Undergraduate students are graded using a separate curve.

Attendance is required in this class.

There are no make-up exams unless under special conditions that must be documented. Late submission of assignments is subject to penalty:

<table>
<thead>
<tr>
<th>Number of days late</th>
<th>Percentage of points taken off</th>
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<tr>
<td>1</td>
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<td>2</td>
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<td>4</td>
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<td>&gt;=5</td>
<td>100%</td>
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**Final exam is held on Tuesday, March 18, 1:30-3:30pm in the classroom.**

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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 labs/assignments to receive a “T” grade.

**Tentative Course Schedule:**

<table>
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<tr>
<th>Week</th>
<th>Topics and Reading Materials</th>
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<tr>
<td>1)</td>
<td>Data sources, data conversion, and map projection transformation (Huxhold, chpt. 5)</td>
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<td>2)</td>
<td>Spatial analysis and spatial modeling and GIS (Longley, chpt. 8, 7; Birkin, chpt. 3, 1; Chou, chpt. 8)</td>
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<td>3)</td>
<td>Urban environment and environmental equity (Liu; Sui)</td>
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<td>4)</td>
<td>Network analysis: shortest path, traveling salesman, and shipment problem (Chou, chpt. 7)</td>
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<td>5)</td>
<td>Urban traffic stop analysis, crime mapping and analysis (Eck and Liu)</td>
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<td>6)</td>
<td>Market area delineation (Huff, Xu and Liu)</td>
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<td>7)</td>
<td>Retail site location (Birkin, chpt. 4)</td>
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<td>8)</td>
<td>Decision supporting system for retail planning (Birkin, chpt. 5)</td>
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<td>9)</td>
<td>Geodemogrphies and marketing: an example of a GIS for motor industry (Longley, chpt. 5, 6, 7; Birkin, chpt. 9)</td>
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<tr>
<td>10)</td>
<td>Land records information, map updates and other applications of urban GIS (Huxhold, chpt. 10, 3; Birkin, chpt. 7, Tu and Massucci)</td>
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**Tentative List of Assignments:**

1) Uncovering map projection/coordinate system of a data set
2) Searching GIS databases on the Internet
3) Exploring urban environmental equity issues
4) Network analysis
5) Market area delineation – The Huff Model

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