

# Geographic Information Science

## GEOG 758, Fall 2007

### Instructor Information:

Dr. Xingong Li  
Office: 409 Lindley Hall  
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Office Hours: Wednesday 10:00am—12:00 and 1pm—2pm or by appointment

### Class Meetings:

Monday 10am—12:50pm, room 401

### Textbooks:

- [GA] Mike J. de Smith, Mike F. Goodchild, and Paul A. Longley, 2004. *Geospatial Analysis: A comprehensive Guide to Principles, Technique and Software Tools*, Web Version (<http://www.spatialanalysisonline.com/>).
- [MM] Duane Hanselman and Bruce Littlefield, 2005, *Mastering MATLAB 7*, Pearson/Prentice Hall.

### Course Objectives:

Understanding that the overlay and buffering capabilities of vector GIS and the map algebra operations of raster GIS are the most frequently used albeit basic spatial analysis, this course introduces a variety of advanced analysis and statistical techniques that have been designed specifically for spatial and spatio-temporal data. Specifically, the course will cover temporal map algebra, spatial statistics, and geostatistics with applications drawn from hydrology, climatology, and meteorology. The geospatial analysis techniques are explored mainly through the MATLAB programming environment although other software tools will also be used.

### Tentative Course Outline:

Week	Lectures	Readings
1 8/20	Getting started with MATLAB	[MM] 1, 2, 3
2 8/27	<b>No class</b>	[MM] 5, 6, 7, 8, 9, 15
3 9/3	Labor Day <b>No class</b>	[MM] 4, 10, 11, 12
4 9/10	Data types, flow control, and functions	[MM] 14
5 9/17	File input and output	[MM] 26, 27, 28, 29, 31
6	Data visualization	[GA] 1

9/24		
7 10/1	Cartographic modeling	[GA] 2
8 10/8	Temporal analysis	[GA] 3
9 10/15	Temporal analysis	[GA] 4
10 10/22	Basic data analysis	[MM] 18 [GA] 5
11 10/29	Spatial Statistics	[GA] 5
12 11/5	Spatial Statistics	[GA] 5
13 11/12	Spatial Statistics	[GA] 6 [MM] 19
14 11/19	Spatial Interpolation and Geostatistics	[GA] 6
15 11/26	Spatial Interpolation and Geostatistics	[GA] 6
16 12/3	Spatial Interpolation and Geostatistics	
17 12/11	<b>Final Project Presentation</b> 7:30—10:00	

### Course Evaluation:

Your course grade will be based on **5 homework** and **a final project**. The 5 mini projects have 60 points (12 points each) while the final project counts 40 points. The 5 mini projects are primarily MATLAB programming assignments. The final project will use at least one of the advanced analysis techniques but is not limited to MATLAB. A proposal for final project will be required. Final projects will be presented in the final exam week. There is no final exam.

### Student Responsibilities:

As a student, it is your responsibility to attend the lectures, do the readings, and finish homeworks and projects. All students should be prepared to participate in class and answer questions when called upon. All students are expected to complete assignments on time. Homeworks are typically due one week after they are assigned, unless otherwise noted. Late homeworks are docked by 10% for each day that they are late up to one week. Makeup homeworks are possible if the instructor has advance notice.