

Geography 547 – Spatial Analysis

Fall 2007

Class Place & Time: Lec 001 (TR 12:30 pm - 1:45 pm) at Bolton Hall (BOL) B95

Instructor

Professor Changshan Wu

Office: 482 Bolton Hall

Phone: 229-4860

Email: cswu@uwm.edu

Office Hours: Tuesday, Thursday 11:00 am – 12:00 pm or by appointment

Textbooks:

Required

Hamilton, Lawrence, 1992, *Regression with Graphics, A second course in applied statistics*, Duxbury Press, ISBN: 0-534-15900-1

Optional

Oliver, S. and Gotway, C., 2005, *Statistical Methods for Spatial Data Analysis*, CRC Press, ISBN: 1-58488-322-7

Software for exercise:

- (1) SPSS, references can be found at the Main Library
- (2) GeoDa, can be downloaded at URL: <https://www.geoda.uiuc.edu/>
- (3) An Introduction to R: can be downloaded at URL: <http://www.r-project.org/>
- (4) ArcGIS spatial analysis toolbox

Class website:

Class website can be accessed through D2L.

Course Description and Objectives

The objective of this course is to introduce basic statistical methods for describing, modeling, and analyzing spatial (geographical) data. The majority of this course will focus on the statistical analysis of non-spatial data, such as descriptive statistics, ordinary least square (OLS) regression analysis, logit regression, principal component and factor analysis, cluster analysis, and analysis of variance. The rest of this course will focus on

spatial data handling. In particular, spatial autocorrelation and spatial regression will be introduced.

Credit Hours

This course has three credit hours (graduate and undergraduate) consisting of two 75-minute lectures each week.

Prerequisites

Junior status; Geog 247(447) or dept-approved equiv. Course Evaluation

Undergraduate

- 1. Examinations (60% of class grade)** - There will be a mid-term and a final examination for this course (30% each).
- 2. Exercises (30% of class grade)** – Five (5) take-home exercises will be given and collected corresponding to the topics covered in the class.
- 3. Class participation (10% of class grade)** - Throughout the semester, quizzes and other assignments may be given as a component of class participation. Attendance and participation in class discussion are expected of all students.

Graduate

- 1. Examinations (40% of class grade)** - There will be a mid-term and a final examination for this course (20% each).
- 2. Exercises (30% of class grade)** – Five (5) take-home exercises will be given and collected corresponding to the topics covered in the class.
- 3. Class project (20% of class grade)** – A project that utilizes statistical technologies to solve research problems is required for graduate students. Students are encouraged to discuss the project with the instructor. The final project report is due at 9:30 am on December 11, 2007.
- 4. Class participation (10% of class grade)** - Throughout the semester, quizzes and other assignments may be given as a component of class participation. Attendance and participation in class discussion are expected of all students.

Grading Scale

- A = 90-100%, A- = 87-89.99%
- B+ = 83-86.99%, B = 80-82.99%, B- = 77-79.99%
- C+ = 73-76.99%, C = 70-72.99%, C- = 67-69.99%
- D+ = 63-66.99%, D = 60-62.99%
- F = 0-59.99%

Make-up: No make-ups will be allowed without emergency reasons with written proof.

Final Exam: At the same classroom.

Notices:

- Grades, once given, are final except in cases of clerical error
- Cheating on exams, map quizzes, or exercises will not be tolerated. Additional information about the policies and procedures can be found at http://www.uwm.edu/Dept/Acad_Aff/policy/uniformsyllabus.html and are posted in the Geography Department main office, BOL 410.
- Attendance is not required but strongly recommended.
- Students are expected to attend each class, and are responsible for their own notes.
- If you are having trouble in class, please come and see me.

Disability Statement:

Any student who feels he or she may need an accommodation based on the impact of a disability should contact me privately to discuss his or her specific needs.

Geography 547 Tentative[#] Schedule (Fall 2007)

Week	Dates	Topic(s)	Text	Due
1	September 4 September 6	Introduction	Chapter 1	
2	September 11 September 13	Bivariate Regression Analysis	Chapter 2	
3	September 18 September 20	Basics of Multiple Regression	Chapter 3	
4	September 25 September 27	Regression Critics	Chapter 4	
5	October 2 October 4	Fitting Curves	Chapter 5	

6	October 9 October 11	Robust Regression	Chapter 6	
7	October 16 October 18	Logit Regression Mid-term preview	Chapter 7	
8	October 23 October 25	Mid-term examination Logit Regression	Chapter 7	
9	October 30 November 1	Principal Component Analysis	Chapter 8	
10	November 6 November 8	Analysis of Variance	TBD	
11	November 13 November 15	Spatial data autocorrelation	TBD	
12	November 20 November 22	Spatial data autocorrelation Thanksgiving holiday (no class)	TBD	
13	November 27 December 29	Spatial regression	TBD	
14	December 4 December 6	Final exam preview Project presentation (graduate)		
15	December 11	Project presentation (graduate)		Graduate project report
	December 17	Final exam (12:30 pm – 2:30 pm)		