

GGG 791: Advanced Spatial Statistics
Spring 2015
Course Syllabus

Instructor:

Timothy Leslie
Associate Professor
tleslie@gmu.edu

Office: Exploratory Hall - 2405
Phone: 703-993-4336
Office Hours: Th 4-5, or by appt.

Class Schedule:

Thursday 7:20 – 10:00pm
Exploratory Hall rm 2310

Text:

No Text

Course Purpose: This course is designed to acquaint you with a number of advanced methods of analyzing quantitative, spatial data. Spatial data possess unique properties and characteristics that classical or mainstream statistical tools may fail to handle and analyze them effectively and correctly. However, it is impossible to obtain the data that can perfectly explain all the truth. This course is concerned with the details in reaching sensible conclusions with imperfect spatial data, a skill set is essential in conducting empirical research in geography, and even the use of GIS and remote sensing technology. We will describe spatial patterns and associations, as well as employ methods to infer trends.

Electronically: Blackboard will be used for the distribution of lectures and assignments. The URL is <http://courses.gmu.edu>. Students should regularly check their Mason email accounts in order to stay abreast of important University information, including messages related to this class.

Evaluation: Students will be graded in the following manner:

Six Homework Assignments	60%
Final Project	35%
Final Project Presentation	5%

Grades generally follow 90/80/70 with plus/minus being within 3 percent of the cutoffs. I reserve the right to alter the exact boundaries at the end of the semester. Homework assignments will set up the analysis completed in each problem set, and are due at the **beginning of class**. Late assignments will be marked off 20% per complete weekday they are late, starting at the beginning of class on the day they are due.

Honor Code: GMU is an Honor Code university; please see the University Catalog for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are treated gravely. What does academic integrity mean in this course? Essentially this: when you are responsible for a task, you will perform that task. When you rely on someone else's work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. *Labs are to be done individually.* When in doubt (of any kind) please ask for guidance and clarification.

Tentative Course Schedule:

Date	Lecture Topic	Hand-In
1/22	Welcome, Statistical Foundation	
1/29	Non-Advanced Spatial Stats	
2/5	Neighborhoods, Spatial Co-Location	Lab 1 Handout
2/12	Correlation, Regression	Lab 2 Handout
2/19	Inequality and Convergence	Lab 1 Due Lab 3 Handout
2/26	PCA, Factor Analysis	Lab 2 Due
3/5	Dummy Variables, When Regression Goes Wrong	Lab 3 Due
3/12	No Class – Spring Break	
3/19	Spatial Clustering	
3/26	Interpolation	Lab 4 Handout
4/2	Gravity and Spatial Interaction Modeling	
4/9	Spatial Regressions	Lab 4 Due Lab 5 Handout
4/16	Hot Spots and Density Calculations	Lab 6 Handout
4/23	Maximum Likelihood	Lab 5 Due
4/30	Course Summary	Lab 6 Due
5/7	Statistical Presentations	Project Write-ups