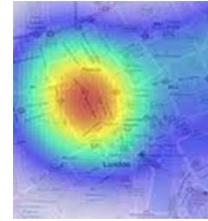




# STATISTICS FOR GEOSCIENCES

GEOS 5350 - Fall 2013

Lectures & Labs Tuesdays and Thursdays 9:45-11:05am  
323 Ross Hall



**Instructor:** Andrew Joyner, Ph.D.  
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**Office hours:** Thursday: 1:00-2:30pm  
or by appointment

## 1. COURSE DESCRIPTION

This course introduces students to multiple forms of spatial statistics with varying levels of difficulty and complexity. Emphasis is placed on finding solutions to inherently geographical problems. This course is very practice-oriented. We will explore various real-world data sets to solve geographic problems by using statistical software packages (e.g., SPSS, CrimeStat, GeoDa, and ArcGIS). This course requires no prerequisites, though some knowledge of basic mathematical concepts and familiarity with the Windows operating environment and ArcGIS is beneficial.

Lectures will precede labs and focus on the background of each spatial statistic and how various software packages can be used to solve spatial problems. Labs will be assigned to demonstrate how these concepts are applied in geography.

### A. Course Format

This course combines traditional instruction organized around classroom lectures, reading material, and computer exercises in a lab format. Labs cover selected topics discussed in lectures and/or reading assignments. A mid-term project will be a proposal for the final project (e.g., literature review and tentative data/methods) and the final project will be a short, journal-style article applying one or more methods from the class.

### B. Course Requirements

Students will be evaluated according to the following:

#### Labs & Assignments:

Ten labs (*tentatively*) and a reading assignment are designed to provide students with hands-on exposure to various statistical tools, programs, and techniques presented during lectures and in readings. Labs will mainly utilize spatial statistics software available in the computer lab. Instructions and guides will be provided for completing the labs in the allotted time. Students will be expected to use the lab periods for guidance and assistance in completing the exercises.

**Projects & Presentations:**

The mid-term and final will complement each other and each individual is expected to turn in his or her own work. A short literature review and data/methods section will be expected for the mid-term and the final project will be a completed journal-style article along with a short presentation.

COURSE REQUIREMENTS & GRADING	
Lab Exercises	250 points (25 points each)
Reading Assignment	20 points
Mid-term Project	30 points
Final Project	100 points
<b>TOTAL</b>	<b>400 points</b>

**C. Readings**

Students are expected to complete all required readings that are assigned periodically throughout the semester. Specific assigned readings during the semester will require a 2-page (double-spaced, Times New Roman, 1" margins) summary.

**D. Grading Policy**

Grading will follow the ETSU grading scale. Deadlines for the assignments and projects are strictly enforced. There is no extra credit, make-up, or late assignment policy.

Scale	Point Equivalent	Grade
92.5 - 100	370 - 400	A
89.5 - 92.49	358 - 369	A-
87.5 - 89.49	350 - 357	B+
82.5 - 87.49	330 - 349	B
79.5 - 82.49	318 - 329	B-
77.5 - 79.49	310 - 317	C+
69.5 - 77.49	278 - 309	C
< 69.5	< 278	F

**E. Class Policies**

The following policies guide this course

- Silence cell phones while in the class room.
- Respect your classmates and instructor by being on-time and prepared for class.
- Always ask questions!
- No food allowed in the class room.
- If you miss a class for any reason, you are responsible for any assignments and/or obtaining the information discussed in class.

## 2. TECHNOLOGY REQUIREMENTS, COMMUNICATIONS, AND SUPPORT

This course is **technology intensive** and will require you to use technology as a tool for learning. It is your responsibility to familiarize yourself with the technologies.

### A. Student Technology Competency

This course will include computer and online instruction and assignments. You must have computer/internet competency in order to function independently in the course, including the ability to:

- Use a Web browser to access online content;
- Download files, unzip compressed files, and install software;
- Use basic features of word processing and spreadsheets (copy, cut, paste, sort, save files, etc.);
- Use basic mapping tools (e.g., Google Earth, Google Maps, Bing Maps, and/or Yahoo! Maps); &
- Basic data management skills within the Windows 7 or newer operating system (e.g., manage and maintain files).

### B. Technology Support

The GIS lab is open various times throughout the day when another class is not being taught. You can check out specific times on this webpage: <http://www.etsu.edu/cas/geosciences/facilities.aspx>

For technical support with a University related technical problem, contact the Office of Information Technology (OIT) at <http://www.etsu.edu/oit/>. Or contact them through their e-mail: [oihelp@etsu.edu](mailto:oihelp@etsu.edu)

### C. Accommodations for Disabilities

If you have a disability that may impact your work in this class and may require accommodations, please inform the instructor and contact Disability Services through the following webpage: (<http://www.etsu.edu/students/disable/>)

## 3. ACADEMIC RESPONSIBILITY

As a student at East Tennessee State University, you have acknowledged the standards that have been defined in the Student Code of Conduct, and thus you have agreed to adhere to its tenets.

### A. Plagiarism

Students are responsible for submitting work that reflects their individual performance. Misrepresentation of your own work either through plagiarism, collusion, or data distortion is a serious breach of the code of student conduct. If you have any questions on what constitutes plagiarism, review it in the [ETSU Student Handbook](#).

#### 4. **TENTATIVE** LECTURE/READING/LAB/PROJECT SCHEDULE

WEEK	Dates	TOPICS & READINGS	ASSIGNMENTS
1	Aug 27/29	Introduction and Overview of Spatial Statistics	
2	Sept 3/5	Overview of Spatial Statistics (contd.) and Trade Area Analysis (ArcGIS)	
3	Sept 10/12	Describing Data and Centographic Statistics (CrimeStat)	Lab 1 Due
4	Sept 17/19	Point Patterns and Kernel Density Estimation (CrimeStat)	Lab 2 Due
5	Sept 24/26	Calculating Bandwidth and Exploring Journal Articles (CrimeStat)	Lab 3 Due
6	Oct 1/3	Distance Analysis and Hot Spot Analysis (CrimeStat)	Lab 4 Due
7	Oct 8/10	Reading Assignment	Lab 5 Due
8	Oct 15/17	Fall Break and Mid-Term Project	Reading Summary Due
9	Oct 22/24	Temporal Analysis (ML Regression) (SPSS)	Mid-Term Project Due
10	Oct 29/31	Interpolation Techniques (Deterministic and Geostatistical) (ArcGIS)	Lab 6 (Peer Rev) Due
11	Nov 5/7	Global and Local Spatial Autocorrelation (GeoDa)	Lab 7 Due
12	Nov 12/14	Spatial Regression (GeoDa)	Lab 8 Due
13	Nov 19/21	Cluster Analysis and Final Project Overview (GeoDa)	Lab 9 Due
14	Nov 26/28	Individual Project Meetings and Thanksgiving Break	Lab 10 Due
15	Dec 3/5	Final Project Open Lab and Q&A	
16	Dec 7-12	Exam Week	Final Project Due

*The course schedule, required readings, and procedures described in the syllabus are subject to change. Students will be informed of any such changes via the D2L course site and/or via email.*