

**Quantitative Methods in Geographic Research**  
**GEO4/540: Fall 2008, Section 101 - CRN \_\_\_\_\_ or CRN \_\_\_\_\_**  
**Undergrad Prerequisite = MTH121 or higher**  
**3 credit hours**

Instructor: James Leonard, Ph.D.	Time: T 4:00-6:20pm
Phone: (304) 696-4626	Place: HH235
Office (HH208): MWF 9:30-11:00am; T 2:30-4:00pm; or by appointment	<a href="mailto:leonard@marshall.edu">leonard@marshall.edu</a>

Course objectives:

- Describe the purpose, meaning, and use of quantitative methods and statistics in geographical research.
- Calculate basic spatial statistics that geographers use for research.
- Evaluate statistical and geostatistical research by reading research and answering questions about it.
- Design a real-world quantitative analysis; employ methods learned in this course to analyze data; integrate your analysis into a larger research agenda.

Required materials:

1. McGrew, J.C., Jr. and C. B. Monroe. Introduction to Statistical Problem Solving in Geography, 2nd ed., NY: McGraw-Hill, 2002.
2. Workbook to accompany McGrew and Monroe.
3. A good calculator.

**You must bring the books and calculator to every class, including exams.**

Organization of Class Time:

Class time will consist of one or more of the following: 1) presentations and examples of quantitative and statistical techniques used by geographers; 2) exercises designed to help you learn statistical techniques; 3) discussion of class readings.

### Time Outside of Class:

You must attend every class! This class, though, consists of more than simple class attendance. If you are an average student, expect to spend a minimum of six hours outside class each week reading the chapters and handouts, practicing the quantitative methods, completing homework exercises, reflecting on your class work, and studying for exams in order to do well in this class.

### Grading:

Grades will be based on ten homework assignments (20 points each) for 200 points, three exams (100 points each), and a final quantitative analysis project for 100 points. Homework assignments will consist of quantitative techniques AND writing about the techniques. Graduate students will be expected to perform at a higher level of analysis and writing than undergraduates. Graduates will have more extensive homework assignments and more difficult questions on exams that will emphasize the application of statistics and geostatistics to research. The final project will also be more extensive for graduates. Final grades will be determined by the total number of points you have earned:

- A = 600 - 540 (100-90%)
- B = 539 - 480 (89-80%)
- C = 479 - 420 (79-70%)
- D = 419 - 360 (69-60%)
- F = < 299 (less than 60%)

Exam format will be previewed before the first exam. Make the best use of these assignments, exams, and project, because there will be **no extra credit** and **no grades will be scaled or curved**.

### Attendance Policy:

You must attend every class. Exercises will be due the class after they are assigned. You must turn them in by the due date or before! You must attend class for exams.

I follow University policy for excused absences. You must provide adequate documentation for any excused absence. No unexcused absences will be accepted. Missing three or more days (excused or unexcused) probably means failure in this course. **You will be held to the highest standards in regard to attendance, participation, and punctuality when completing assignments.**

### Academic Dishonesty:

University policy states that any act of a dishonorable nature which gives the student engaged in it an unfair advantage over others engaged in the same or similar course of study is prohibited. *You must do your own work on exams and the final project, but you may help and be helped by a classmate or the instructor to complete statistics exercises in and out of class. This help will not be considered cheating.*

**You will be given a final grade of F for any instance of cheating/plagiarizing on an exam or project.**

Withdrawal Policy:

A drop slip signed by me or the chairman of the Geography Dept. must be submitted to the Registrar to receive a W during the period set by the university. After the W period, you may only drop this class by complete university withdrawal. **Failure to follow these university procedures will result in a final grade of F.**

**Schedule (subject to change):**

- Aug. \_\_: Chapter 1 - Math warm-up, quantitative methods' place in geographic research, data characteristics, LQs.
- Sept. \_\_: Chapter 2 - Histograms, scatterplots in SPSS, mapping quantities; meet with Prof. Leonard to discuss project.
- Sept. \_\_: Chapter 3 - Descriptive statistics, Excel for descriptive statistics, spatial issues with descriptive stats (e.g. the dissimilarity index).
- Sept. \_\_: Chapter 4 - Descriptive spatial statistics; geographic center.
- Sept. \_\_: Wrap up and review.
- Sept. \_\_: EXAM 1; meet with Prof. Leonard to discuss project.
  
- Oct. \_\_: Chapter 5 - Probability, the normal distribution.
- Oct. \_\_: Chapters 6&7 - Sampling, estimation in sampling; Project element #1 due today.
- Oct. \_\_: Chapter 8 - Inferential statistics; meet with Prof. Leonard to discuss project
- Oct. \_\_: Chapter 9 - Difference tests
- Oct. \_\_: EXAM 2
  
- Nov. \_\_: Chapter 10 - ANOVA
- Nov. \_\_: Chapter 11 - Goodness of fit; meet with Prof. Leonard to discuss project
- Nov. \_\_: Chapter 12 - Inferential spatial statistics; Project element #2 due today
  
- Nov. \_\_: THANKSGIVING BREAK!
  
- Nov. \_\_: Chapters 13 and 14 - Correlation and Regression; meet with Prof. Leonard to discuss project.
- Dec. \_\_: EXAM 3