

Instructor: Terry Slocum  
Phone: 864-5146 E-mail: t-slocum@ku.edu  
Office: 215 or 207 Lindley  
Office Hours: MWF 1:30-3:00 PM and by Appt.

Teaching Assistant: Jenny Brackhan  
Phone: 864-2473 E-mail: brackhan@ku.edu  
Office: 500 Lindley  
Office Hours: Mon 8:00-9:00 AM, Tues 3:00-4:00 PM,  
Thurs 3:00-4:00 PM and by Appt.

### **Goals of the Course**

The goals of the course are to develop your ability to: 1) understand basic descriptive and inferential statistical methods commonly used in geography; 2) work with computer tools used to analyze spatial data (SPSS and GeoDa); 3) not only perform statistical analyses, but be able to clearly explain these analyses; and 4) select the proper methods for analyzing various sets of spatial data.

### **Students with Disabilities**

The staff of Services for Students with Disabilities (SSD), 135 Strong, 785-864-2620 (v/tty), coordinates accommodations and services for KU courses. If you have a disability for which you may request accommodation in KU classes and have not contacted them, please do so as soon as possible. Please also see me privately in regard to this course.

### **Academic Misconduct**

Copying, plagiarism, or other academic misconduct at any time during the semester will not be tolerated. Please be aware that the University's policy on academic misconduct can be found in Article II, Section 6 of the University Senate Rules and Regulations. You can access the entire list of Senate Rules and Regulations at [www.studenthandbook.ku.edu](http://www.studenthandbook.ku.edu).

### **Grading**

Your grade will be a function of attendance and your performance on calculator-based exercises, computer-based exercises, and exams. The relative contributions to your grade will be as follows:

Attendance (10%)  
Calculator-based exercises (20%)  
Computer-based exercises (20%)  
Exams (50%)

There will be 4 exams in the course. Each exam will cover approximately one-fourth of the course. It will be necessary to recall concepts from earlier exams for subsequent ones. Prior to each exam I will discuss the nature of exam questions, using questions from prior semesters. Below is the exam schedule:

- Exam 1: Wednesday, September 12, 5:45 - 7:45 PM
- Exam 2: Tuesday, October 9, 5:45 - 7:45 PM
- Exam 3: Wednesday, November 7, 5:45 - 7:45 PM
- Exam 4: Tuesday, December 11, 7:30 - 10:00 AM

Due dates for calculator-based exercises will be given with each assignment. Exercises handed in one class period beyond the due date will receive at most 75% of the maximum score. No exercises will be accepted more than one class period beyond the due date.

Although this course emphasizes mathematical manipulations, some writing will be required. If you would like assistance with writing, I encourage you to utilize the KU Writing Center (<http://www.writing.ku.edu>) For more information, please call 864-2399 or e-mail [writing@ku.edu](mailto:writing@ku.edu).

### **Supplies**

The following supplies should be purchased for this course:

- A calculator (specifications to be given in class)
- Since we will be making use of the microcomputers in the computer lab, I recommend that you acquire a USB flash drive (or other storage device) appropriate for these PC-based machines. (Jenny will discuss the options during your first lab.)

### **Blackboard**

We will use Blackboard for some things in the class (e.g., e-mail, distributing copies of labs and exercises, and distributing grades). You can access blackboard at <http://courseware.ku.edu/>.

### **Required Texts**

Burt, James E. and Barber, Gerald M. 1996. *Elementary Statistics for Geographers*. Second Edition. New York: The Guilford Press.

Slocum, Terry A. 2007. *Course Notes for Geog 316: Methods of Analyzing Geographical Data*.

### **Other Readings (on Electronic Reserve in Anschutz Library)**

Hammond, R. and McCullagh, P.S. 1978. *Quantitative Techniques in Geography: An Introduction*. Oxford: Clarendon Press.

Burn, C.R. and Fox, M.F. 1986. "Introducing Statistics to Geography Students: the Case for Exploratory Data Analysis," *Journal of Geography*, Vol. 85, No. 1, pp. 28-31.

Becker, R.A., Denby, L., McGill, R., and Wilks, A.R. 1987. "Analysis of data from the *Places Rated Almanac*," *The American Statistician*, Vol. 41, No. 3, pp. 169-186.

## **Topics to be Covered**

Pages listed are from Burt and Barber (1996), with the exception of the following: HM = Hammond and McCullagh, BF = Burn and Fox, Becker = Becker et al.

I. INTRODUCTION	1-30
A. Descriptive vs. Inferential Statistics	
B. Why Study Quantitative Methods?	
C. Variables and Observations	
D. Levels of Measurement	
II. DISPLAYING DISTRIBUTIONS	35-48
A. Introduction	
B. Tabular Displays	
C. Graphic Displays	
III. NUMERICAL SUMMARIES OF DISTRIBUTIONS	
A. Introduction	
B. Measures of Central Tendency	48-59, 68-70
C. Measures of Dispersion	60-67
D. Handling Outliers in Data	
IV. EXPLORATORY DATA ANALYSIS	539-547, BF
A. Introduction	
B. Stem-and-leaf plot	
C. Box plot	
V. DESCRIPTIVE STATISTICS FOR SPATIAL DISTRIBUTIONS	
A. Introduction	76-79
B. Measures of Central Tendency for Point Data	85-87
C. Measures of Dispersion for Point Data	94-97
D. A Weighted Mean Center	87-89
E. Applications of Mean Center and Standard Distance	
F. Determining an Optimal Location for a Facility	89-94
G. Point Pattern Analysis	HM 269-273, 275-277
H. Measurement of Shape	HM 68-71
VI. COMBINING GEOGRAPHIC VARIABLES	HM 40-44, Becker
VII. BASIC PROBABILITY CONCEPTS	145-164
VIII. RANDOM VARIABLES AND THE NORMAL DISTRIBUTION	
A. Introduction	
B. Definition of Random Variables	167-177
C. Discrete vs. Continuous Random Variables	
D. Probability Distributions	
E. Probability Distribution Models	177-180, 192-198
IX. SAMPLING	
A. Introduction	
B. Why Collect a Sample?	215-218
C. Initial Steps in the Sampling Process	218-223
D. Types of Probability Samples	223-231, 242-250

X. SAMPLING DISTRIBUTIONS AND THE CENTRAL LIMIT THEOREM	232-242
A. Sample Statistic	
B. Sampling Distribution	
C. Central Limit Theorem	
XI. CONFIDENCE INTERVALS AND THE T DISTRIBUTION	253-272
XII. HYPOTHESIS TESTING	280-299, 302-305
A. What is a Hypothesis?	
B. Classical Method for Testing Hypotheses	
C. One-tailed vs. Two-tailed Tests	
D. Prob-Value Method of Hypothesis Testing	
E. Type I and Type II Errors	
XIII. PARAMETRIC TWO-SAMPLE TESTS	
A. Introduction	
B. Difference-of-means Test	308-317
C. Equality of Variance Test	325-329
XIV. NONPARAMETRIC TESTS	
A. Parametric vs. Nonparametric Statistics	331-334
B. Mann-Whitney U Test	338-344
C. Chi-square Test	354-360, 364-370
D. Kolmogorov-Smirnov Test	360-364
E. Difference-of-means vs. Mann-Whitney U	
***Time permitting, we will also cover the following:	
XV. PARAMETRIC CORRELATION AND REGRESSION	383-393, 425-444 467-472
A. Introduction	
B. Correlation	
C. Regression	
D. Hypothesis Testing	