GCU 495:   **QUANTITATIVE METHODS IN GEOGRAPHY**
Fall Semester, 2007, Tu-Th 12:15-1:30 PM
Room: SCOB 310, Schedule Line No. 77795

Professor: Dr. Michael Kuby (mikekuby@asu.edu)
SCOB 140, Phone: 480-965-6850 (until I move to COOR)
SCOB 330D (Tu/Th office hours in SCOB after I move to COOR)
COOR 5568, Phone: same as in SCOB

Office Hours: Tuesdays 1:30-3:00 PM (in SCOB)
Wednesdays 10-11 AM (in COOR)
Thursdays 11-12 AM (in SCOB)
or by appointment

Teaching Assistant: Dominic Campanaro (Dominic.Campanaro@asu.edu)
SCOB 314, Phone: 965-9425
Office Hours: Tuesdays 10-11 AM, Thursdays 2-3 PM, Fridays 1-2 PM
or by appointment

Required Texts: James E. Burt and Gerald M. Barber. 1996. Elementary Statistics for
Geographers, (2nd ed.). New York: The Guilford Press.

A packet of class materials is available for purchase at the copy window at
the Union Station in the MU basement. They will include lecture notes,
copies of some overheads, and lists of practice problems and answers.

Software: SPSS (Statistical Package for the Social Sciences) 14.0 for Windows,
available in SCOB316 (all semester) and SCOB328 (starting in October)
and on the campus network.

CLASS POLICIES

Learning Objectives:

ASU (CS) General Studies standards that students will be expected to accomplish:	Specific performance objectives that students are expected to master:	Assessment of Performance Objectives:

Students will learn statistical applications.
 	
a. Students come into the class with a minimum mathematical prerequisite
 	
b. Students obtain knowledge in statistical inference and include coverage of:
    i. design of a statistical study;
    ii. summarization and interpretation of data;
    iii. methods of sampling;
    iv. standard probability models;
    v. statistical estimation;
    vi. hypothesis testing; and
    vii. regression or correlation analysis.
	1. Students will be able to apply the rules of probability to statistical decision making.
	
	2. Students will be able to assemble and manipulate a geographical data set.
	
	3. Students will be able to formulate a research program from data collection, to data analysis and report writing.
	
	4. Students will demonstrate understanding of the objective and subjective aspects of statistical analysis.
		i. written exams.
		
		ii. written reports for constructive evaluation by instructor.

Prerequisite. MAT119 (Finite Math) is a prerequisite of this course. It is necessary to pass this course or a higher-level math course before enrolling in GCU495.

Class Attendance. Regular and prompt class attendance is required. Points are awarded for good attendance and, after two unexcused absences, you will start losing 1 percentage point off your final average for each missed class. Always bring your book, packet of handouts, and a calculator to class.

Problem Sets. We will hand out nine problem sets that will allow you to practice the kinds of questions that will be on the exams. Each is worth 1% of the final grade except for the Central Limit Theorem problem set, which is worth 4% and involves a computer lab. Late problem sets will not be accepted.

Papers: There will be three papers. Each student will be responsible for developing his/her own data set related to his/her area of interest in geography. You will run a statistical analysis on your dataset using SPSS and writing up the results in a short paper.

Exams. There will be two midterm exams and a final exam involving definitions, conceptual questions, graphing, and math problems, and questions interpreting SPSS output. The midterms are not cumulative. The final exam is cumulative (covers the entire course) but concentrates on the last third of the course. The final exam is scheduled for Tuesday, Dec 11, 12:20-2:10 PM in our regular classroom.

Late Policy. There will be no make-up exams for the final exam, so set your alarm and/or plan your travel accordingly. For Midterms and papers, make-ups or late submissions will be allowed only if the student has approved it with the professor in advance of the test. Even so, I will require confirmation of your excuse via valid written proof. If you miss an exam or hand in a paper late, but do not tell me until afterwards, you will get a score of Zero.

Cheating. I will not tolerate cheating and will give no second chances. I will bring any cheating cases to the attention of the Dean of Students.

Grades. Grades will be determined as follows:

Attendance (miss ≤ 2)	2%	(miss 3 = 0%, each additional = -1%)
3 Papers	36%	(12% each)
Problem Sets	12%	((8 * 1%) + (1 * 4%))
2 Midterms	25%	(12.5% each)
Final Exam	25%	
Total	100%	

The class will be graded on a standard +/- scale:

97.0-100% = A+	87.0-89.99% = B+	77.0-79.99% = C+	67.0-69.99% = D+	
93.0-96.99% = A	83.0-86.99% = B	73.0-76.99% = C	63.0-66.99% = D	Under 60% = E
90.0-92.99% = A-	80.0-82.99% = B-	70.0-72.99% = C-	60.0-62.99% = D-	

Grades will be posted periodically on the My.ASU system.

No extra credit papers or assignments will be allowed, so don't ask!

Computers: SPSS runs on the campus computer network, and also on the Geography Department computer network in SCOB 328/316. Get your work done ahead of time, and back up your work frequently in at least 2 places. The excuses that "no computers were available" or "my file/disk was destroyed" will not be accepted.

Incompletes: I will grant incompletes only in unusual circumstances out of your control. As per university policy, an incomplete automatically reverts to an E after one year if the agreed upon work has not been successfully completed.

Keys to Success in this Class
1. Never miss class.
2. Take a lot of notes.
3. Participate.
4. Don't fall behind.
5. Choose a data set that will keep you interested.
6. Do the problem sets, even though they may only be worth 1-2% each.
7. Know standard deviations. They are a key to all that follows. Really understand how and why they work.
8. Know the central limit theorem and sampling distributions. They are the keys to inferential statistics.
9. Take advantage of office hours.
10. Study with other people.

TENTATIVE COURSE OUTLINE

WK	DATES	TOPICS	CHAPTER	ASSIGNMENT DUE
1	Aug. 21	Introduction to statistics in geographical research.	Ch. 1	
	Aug. 23	Percentages. Descriptive Statistics. Kinds of data. Frequency distributions. Measures of central tendency.	Ch. 2.1 - 2.2	
2	Aug. 28	Choosing your data for the semester. Sampling procedures.	Ch.7 (except 7.5)	
	Aug. 30	Measures of dispersion.	Ch. 2.3 - 2.4	
3	Sept. 4	LAB: Introduction to SPSS.		Problem Set 1 And bring your data in digital form.
	Sept. 6	Dispersion, cont'd. Descriptive Geographical Statistics (only the following concepts: Thiessen polygons; location quotients; Lorenz curves; mean and weighted mean centers, Manhattan, Euclidean, and weighted Euclidean medians, standard distance, quartildes, and boundary, scale, and modifiable areal unit problems)	Ch. 3 (except 3.3)	
4	Sept. 11	Geographical Statistics, cont'd. Time Series Analysis	Ch. 4	Paper 1 (Descriptive Statistics) Due
	Sept. 13	Time Series Analysis	Ch. 4	
5	Sept. 18	**Midterm #1**		Problem Set 2
	Sept. 20	Probability	Ch. 5	
6	Sept. 25	Random variables and probability distributions.	Ch. 6.1 - 6.3	
	Sept. 27	Normal (z) distribution.		
7	Oct. 2	Sampling Distributions. Central limit theorem.	Ch. 7.5	Problem Set 3
	Oct. 4	LAB: Central limit theorem.		
8	Oct. 9	Parametric statistical inference. Confidence intervals.	Ch. 8	Problem Set 4 (worth 4%)
	Oct. 11	Hypothesis testing. Types of errors. Levels of significance. Degrees of freedom.	Ch. 9	
9	Oct. 16	Two-sample (difference of means) test. z-test vs. t-test.	Ch. 10	Problem Set 5

	Oct. 18	Two-sample difference of means test.		
10	Oct. 23	LAB: Difference of means test. One-sided and two-sided hypothesis tests.		Problem Set 6
	Oct. 25	ANOVA		Paper 2 (Difference of Means) Due
11	Oct. 30	ANOVA	Ch. 11.4 Packet 4	
	Nov. 1	**Midterm 2**		Problem Set 7
12	Nov. 6	Scatter Diagrams	Ch. 12.1, 12.3	
	Nov. 8	Correlation		
13	Nov. 13	Bivariate Linear Regression–Curve fitting (central tendency)	Ch. 13	Problem Set 8
	Nov. 15	Bivariate Linear Regression – Goodness of fit (dispersion around the line)		
14	Nov. 20	Bivariate Linear Regression – Inferential (hypothesis testing)	Ch. 14	
	Nov. 22	**Thanksgiving Day – No Classes**		
15	Nov. 27	LAB: Multiple Regression	Ch. 14.5 and Packet 3	Problem Set 9
	Nov. 29	LAB: Multiple Regression and Dummy Variables		
16	Dec. 4	Contingency Tables revisited: Inferential Hypothesis Testing Using Chi-Square	Packet 3 Ch. 11.4	Paper 3 (Multiple Regression) Due
	Wed Dec. 5	**Reading Day–review session at 11:00 AM-12:30 PM Free Pizza at end.** Paper 3 handed back		
	Tuesday Dec. 11 12:20-2:10 PM	**FINAL EXAM (Cumulative)**		