BER 540, Statistical Methods in Education
Gadsden, Summer 2007

Department of Educational Studies in Psychology, Research Methodology, and Counseling
Program: Educational Research
Credit Hours: 3
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Office Hours (June): Tuesday, Wednesday 10:00-11:45
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CATALOGUE DESCRIPTION

Descriptive and basic inferential statistics, including graphs, frequency distribution, central tendency, dispersion, correlation, and hypothesis testing. Computer applications are included.

CONCEPTUAL FRAMEWORK

Experiences in academic programs are devoted to developing individuals' understanding of *knowledge construction*, *pedagogy*, and *responsible professional practice in the contexts of education*. The University of Alabama's College of Education seeks to prepare professionals who value and demonstrate *reflective practice and ethical decision making* through *respecting diversity, honoring difference, and promoting social justice*.

KNOWLEDGE BASE

BER 540 will address knowledge construction and learning through the different statistical procedures that are discussed in the course. The student will be instructed on responsible professional practice in the contexts of education, diversity, honoring differences, and promoting social justice when using statistical procedures in the interest of research.

COURSE OBJECTIVES

1. The student will be able to demonstrate knowledge of statistical terms.
2. The student will be able to differentiate between descriptive and inferential statistics.
3. The student will be able to identify types of data.
4. The student will be able to identify types of variables.
5. The student will be able to identify the measurement level for each variable.
6. The student will be able to identify the four basic sampling techniques.
7. The student will be able to organize data using frequency distributions.
8. The student will be able to represent data in frequency distributions graphically using histograms, frequency polygons, and ogives.
9. The student will be able to summarize data using the measures of central tendency, such as the mean, median, and mode.
10. The student will be able to summarize data using the measures of variation, such as the range, variance, and standard deviation.
11. The student will be able to identify distributions as symmetrical or skewed.
12. The student will be able to identify the kurtoses of a distribution, such as leptokurtic,

platykurtic, or mesokurtic.

13. The student will be able to interpret the Central Limit Theorem.
14. The student will be able to find the probability of compound events using the addition rule.
15. The student will be able to find the probability of compound events using the multiplication rule.
16. The student will be able to find the area under the standard normal distribution, given various *z* values.
17. The student will be able to identify the position of a data value in a data set using percentiles.
18. The student will be able to find probabilities for a normally distributed variable by transforming it into a standard normal variable.
19. The student will be able to find the confidence interval for proportions.
20. The students will be able to find the confidence interval for the mean when σ is unknown or ≤ 30.
21. The student will be able to identify Type I and Type II errors.
22. The student will be able to interpret the level of significance.
23. The student will be able to state the null and alternative hypotheses.
24. The student will know the steps in testing hypotheses about the μ.
25. The student will be able to test inferences about a single mean.
26. The student will be able to test inferences about two independent samples using μ.
27. The student will be able to test inferences about two dependent samples using μ.
28. The student will be able to test inference about a single proportion.
29. The student will be able to test inferences about two independent proportions.
30. The student will be able to use the Chi-square Test of Association.
31. The student will be able to draw a scatter plot for a set of ordered pairs.
32. The student will be able to find the correlation coefficient.
33. The student will be able to interpret the correlation coefficient.
34. The student will be able to find the equation of the regression line.
35. The student will be able to find the coefficient of determination.
36. **Students completing the master's degree in School Counseling will develop knowledge of research and evaluation, to include basic statistics and research designs, with emphasis on the ethical and legal implications of research (SDE 290-3-3-.50 [2] [a] [12])**

COURSE METHODS

Class instruction will involve lecture and the use of an overhead and whiteboard. Students will have hands on work in the computer lab on SPSS®. There will also be hands on instruction in the class on the use of a calculator.

ATTENDANCE AND MAKEUP POLICY

Classroom attendance is strongly recommended since the test and quizzes will be drawn from classroom lectures. More than 1 absence (whatever the reason) will result in a letter grade reduction (10 points) for the final grade. Each additional absence over 2 will be a 5 point grade deduction. Some of your assignments will involve using SPSS® for Windows on a pc, which

will be demonstrated in class. I do not give make-up lab sessions. If you are late to class, leave early, or miss a class get the notes from someone in the class. ASSIGNMENTS ARE TO BE TURNED IN ON TIME! **I WILL NOT ACCEPT LATE ASSIGNMENTS.** I will drop the lowest assignment grade, therefore if you fail to turn in an assignment it will be considered the drop grade. Failure to turn in more than 1 assignment will result in a zero for each assignment not turned in. ASSIGNMENTS ARE TO BE TURNED IN ON TIME! Being absent from class is not an acceptable excuse. You have a schedule of all due dates. All assignments are made 2 weeks before the due date. If you plan to be absent, you can turn in the assignment early, have someone in class turn it in, or e-mail it or fax it BEFORE CLASS**. IF YOU E-MAIL OR FAX AN ASSIGNMENT (MUST BE DONE BEFORE CLASS) I WILL ACKNOWLEDGE RECEIPT OF THE ASSIGNMENT. IF YOU DO NOT HEAR BACK FROM ME, THEN I DID NOT RECEIVE THE ASSIGNMENT. PLEASE RESEND IT IMMEDIATELY. MAKE SURE THAT YOU HAVE THE CORRECT E-MAIL ADDRESS OR FAX NUMBER. IF I HAVE NOT RECEIVED IT BEFORE CLASS IT IS CONSIDERED LATE AND WILL NOT BE ACCEPTED. PLEASE E-MAIL ME IF YOU ARE FAXING ANYTHING. THE E-MAIL SHOULD BE SENT PRIOR TO THE FAX SO I WILL BE LOOKING FOR IT.**
WARNING!! POWER FAILURES, COMPUTER CRASHES, AND COMPUTER VIRUSES ARE NOT ACCEPTABLE EXCUSES FOR FAILING TO TURN IN AN ASSIGNMENT. THERE ARE SEVERAL COMPUTER LABS AVAILABLE FOR YOUR USE. Test and quiz dates are final. The test and quizzes will not be rescheduled due to trips, vacations, job responsibilities, etc. Please plan you schedule accordingly. A missed quiz CANNOT be made up. I will drop the lowest quiz grade. Therefore, if you miss a quiz it will be the drop grade. Missing more than one quiz means you will receive a zero on the missed quiz(zes) more than 1. Failure to take the final at the scheduled time will result in an "I" for the semester. A makeup test will be given at the convenience of the professor. Any possible extra points added to the test will not apply as the makeup test will not be the same as the test taken by the other students.

Remember: Yes, the lectures are optional. Graduation is also optional. Anon

Also, poor planning on your part does not constitute an emergency on my part.

CELL PHONES
Please turn off cell phones and pagers during class. If you are expecting an important call, set the phone to vibrate and sit near the door so you can leave the classroom to answer your call. Please do not answer nor talk on the cell phone in the classroom while class is in progress. Of course to do so before and/or after class is ok.

UNIVERSITY POLICES
Academic Misconduct: Academic misconduct by students includes all acts of dishonesty in any academically related matter and any knowing or intentional help or attempt to help, or conspiracy to help, another student commit an act of academic dishonesty. The Academic Misconduct Disciplinary Policy will be followed in the event of academic misconduct. Please refer to http://registrar.ua.edu/policies/ for the revised *Codes of Conduct*.

Plagiarism is the act of representing the words, data, works, ideas, computer program or output, or anything not generated by the student, as one's own. Plagiarism may be inadvertent or

purposeful; however, plagiarism is not a question of intent. All suspected incidences of plagiarism must be reported by the course instructor to the Assistant Dean of the College of Education. Plagiarism is considered a serious act of academic misconduct and may result in a student receiving an F in the course and suspension from The University. For more information, see http://facultysenate.ua.edu/handbook/append-c.html

WARNING!!!! ALL GRADED ASSIGNMENTS ARE TO BE YOUR OWN WORK. THESE ASSIGNMENTS ARE TO BE DONE BY YOU AND YOU ALONE. IT IS OK TO GET HELP WITH THE HOMEWORK, BUT WHEN YOU DO THE GRADED ASSIGNMENTS, NO!!!!!!!

Statement of Equal Treatment and Disabilities: The instructor and students in this course will act with integrity and strive to engage in equitable verbal and non-verbal behavior with respect to differences arising from age, gender, race, physical ability, and religious preferences.

Reasonable Accommodations: To request disability accommodations, please contact the Office of Disability Services at 205-348-7966. It is located at 133 B Martha Parham Drive. After initial arrangements are made with that office, please contact me for any course accommodations that may be necessary. It will be necessary to provide me with written notification from the Office of Disability Services. You are not protected under applicable disability laws until I am given the official letter **AND** we talk about the accommodations that are being requested (this talk will not occur minutes before class starts or during break). Please note that accommodations are not retroactive. Also, you are still expected to meet the requirements of the course. Students in need of reasonable accommodations relative to class attendance or arrival, course requirements, or related aspects of performance are to initiate such requests with the instructor prior to their anticipated need. Such requests will be accommodated within constraints of fairness and timeliness with regard for all other students enrolled for the course. If your accommodations involve extra time for test taking, you must speak with me at least one week prior to the date. The test will run from 5:00 to 9:30 PM. If you need extra time, you must come BEFORE 5:00. I will not stay past 9:30 PM.

CALCULATOR
You will need a calculator for the course. The recommended calculators are TI-34II, TI-30X II S, or TI-30X II B. I will not spend class time teaching to other calculators. You may stay after class for assistance with other calculators.

WebCT
Handouts for the class can be found on WebCT. These handouts can be either Word documents, PDF files, and/or PowerPoint presentations. You are expected to download the appropriate handouts prior to each class. PLEASE DO NOT COME TO CLASS WITHOUT THE APPROPRIATE MATERIAL. I do not bring extra copies to class. You will also find a copy of the syllabus on WebCT. If your WebCT is not working properly, it is your responsibility to find out why and get the problem corrected. Failure to get on WebCT is not an excuse for failure to turn in an assignment on time. There will be no extensions. You can ask someone in class to make extra copies of the material for you if you are having problems with WebCT. DO NOT ask me to make copies.

E-MAIL
I will use Bamamail for communication purposes. I suggest if you have your e-mail forwarded

from Bamamail that you change it back to Bamamail as there are sometimes as much as a 2 week delay in receiving forwarded messages. This causes a problem when I send an e-mail before class giving important information for that day's class. Also, I occasionally send revised assignments or other important information through e-mail. Please check your e-mail, daily. It is also recommended to check e-mail just before class. Failure to check e-mail is not a valid excuse for missed messages. It is your responsibility to make sure that the accounts are working properly. **I will not resend e-mails**. Please do not use WebCT to e-mail me. When e-mailing me please identify which class you are in. The way to do this is in the subject line put "BER 540." Also, please put your name (first and last) at the end of the message. Please do not e-mail me for grades. I return the graded assignments and test the next class meeting. Please wait until then for your grade. If you miss class, ask at the next class meeting in attendance. Also, if you miss class, please do not send me e-mails asking for the information that was discussed in the missed class. That information should be in the notes that you get from another student. I reiterate, ATTENDANCE IS IMPORTANT.

ALL GRADED ASSIGNMENTS

Since assignments are to be graded, students are expected to work on the assignments INDEPENDENTLY. Questions concerning the assignments should be directed to the instructor. I reserve the right to give a zero for the assignment or refer the student to the Assistant Dean of the College of Education if I suspect dishonesty. I DO NOT PREGRADE ASSIGNMENTS. If you send me an assignment by e-mail or give me an assignment to look over before it is due, I will grade the assignment accordingly. It is not fair to the other students in class to ask me to pregrade. Please ask questions concerning your assignments in class so that other students can benefit.

EVALUATION PROCEDURES

*Quizzes 6 @ 30 points each	130 points
**Final	200 points
*Assignments 5 @ 30 points each	150 points
Total	530 points

*There will be 7 quizzes and 6 assignments given. The lowest quiz score and the lowest assignment score will be dropped.

**The final exam will be comprehensive. The questions will be multiple choice. The test is open book and open notes. However, if you take a makeup final, there is no guarantee that it will be multiple choice.

GRADES

All grades are final. If you fail to answer questions on the test, quizzes, or on the assignments or do not turn in part of an assignment you will not be given a chance to redo. The semester grade is FINAL. There will be no changes in grades except for cases of error in recording the grade and/or a mistake in grading on my part. Please do not ask to redo an assignment or ask for extra credit assignments in order to elevate a grade.

ASSIGNMENTS

The following dates and assignments are subject to change.

Date	Topics and Assignments
June 5	Introduction; Terms; Homework: Handout - Terms Frequency Distributions and Graphs; Skewness; Kurtoses Homework: Handout - Frequency Distributions
June 12	QUIZ 1 Central Tendency; Variation; Percentiles Homework: Handout on Central Tendency and Dispersion Homework: Handout on percentiles Computer lab
June 19	QUIZ 2 Probability; Combinations; Permutations Homework: Handout **ASSIGNMENT 1 DUE**
June 26	**QUIZ 3** Central Limit Theorem; Normal Distribution Homework: Handout **ASSIGNMENT 2 DUE**
July 3	**QUIZ 4** Confidence Intervals; Sample Size Homework: Handout **ASSIGNMENT 3 DUE**
July 10	**QUIZ 5** Error; Power; Hypothesis Testing Homework: Handout Computer Lab **ASSIGNMENT 4 DUE**
July 17	**QUIZ 6** Chi-Square Homework: Handout - Chi-Square Correlation and Regression Homework: Handout - Correlation and Regression Computer Lab
July 24	**QUIZ 7** Catch up and Review **ASSIGNMENT 5 DUE**

July 31 Final Exam
ASSIGNMENT 6 DUE

Internet Resources

There are many statistical resources on the Internet. I would like to point out just one at this point, but it is hot linked to numerous others. It is an interactive textbook by David M. Lane. Its URL is :

<http://www.davidmlane.com/hyperstat/index.html