

BER 540, Statistical Methods in Education  
Gadsden, Spring 2008

Department of Educational Studies in Psychology, Research Methodology, and Counseling  
Program: Educational Research  
Credit Hours: 3  
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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 the mean when  $\sigma$  is known or  $n \geq 30$ .
20. The students will be able to find the confidence interval for the mean when  $\sigma$  is unknown and  $n \leq 30$ .
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  $\mu$ .
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  $\mu$ .
27. The student will be able to test inferences about two dependent samples using  $\mu$ .
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 Goodness-of-fit Test.
31. The student will be able to use the Chi-square Test of Association.
32. The student will be able to draw a scatter plot for a set of ordered pairs.
33. The student will be able to find the correlation coefficient.
34. The student will be able to interpret the correlation coefficient.
35. The student will be able to find the equation of the regression line .
36. The student will be able to find the coefficient of determination.
37. **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 tests will be drawn from classroom lectures. In the past, students who have missed class found it difficult to understand the material and concepts of the course. When missing a class, students cannot ask questions about any clarification that is needed. I often receive e-mails from students asking questions that would have been answered had he/she been in class. For these reasons attendance is required. Anyone who misses 3 classes (whatever the reason, even for job responsibilities) will receive a letter grade deduction (10 points) for the final grade. Each absence over 3 will be 5 additional points for each absence deducted from the final grade. The course content is delivered by lecture and handouts. Also, your assignments will involve using SPSS® for Windows on a pc, which will be demonstrated in class. If you are late to class, leave early, or miss a class get the notes from someone in the class. I do not do make-up lectures and/or make-up lab sessions.

**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. If you are not going to be in class, assignments can be placed in my mailbox, brought by another student, faxed, or e-mailed **before class**. **WARNING!!!! POWER FAILURES, COMPUTER CRASHES, AND COMPUTER VIRUSES ARE NOT ACCEPTABLE EXCUSES FOR FAILING TO TURN IN AN ASSIGNMENT. ALSO, IF YOU E-MAIL 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. IF I HAVE NOT RECEIVED IT BEFORE CLASS IT IS CONSIDERED LATE AND WILL NOT BE ACCEPTED.** There is a lab with 33 computers with SPSS® on them available for your use at the Gadsden Center. Test dates are final. Tests will not be rescheduled due to trips, vacations, etc. Please plan your schedule accordingly. If you miss test 1 because of job responsibilities, an emergency, or any other acceptable\* reason you will take a comprehensive final at the scheduled time for the final test. The grade made on the final will be the grade for both test 1 and test 2. Since the comprehensive final is not the same test taken by the other students, any possible extra points added to test 1 and/or test 2 will not apply. Failure to take test 2 at the scheduled time will result in an "I" for the semester. A makeup test will be given at the convenience of the professor (usually at the start of the next semester). As the case with the comprehensive final, any possible extra points added to test 2 will not apply as the makeup test will not be the same as the test taken by the other students. Test times run from 5:00 to 9:00 PM on the scheduled date. If you are late, the test still ends at 9:00 PM. There will be no extra time allowed.

**\*NOTE: In order to be allowed to take the comprehensive final due to missing test 1, I must be contacted prior to the missed test (phone, e-mail, or in person) with an acceptable reason (I reserve the right to determine if the reason is acceptable). If contacting me is not possible before, then you need to contact me within 24 hours after the test, otherwise you may receive a '0' for the missed test. Missing test 1 does not mean that you will**

**automatically be allowed to take the comprehensive final. Be aware that going on vacation is not an acceptable reason. The same applies for missing test 2. I need to be contacted.**

### **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 process. Of course to do so before and/or after class is ok.

### **UNIVERSITY POLICIES**

#### 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:

Plagiarism is the act of representing the words, data, works, ideas, computer program or output, or anything not generated by the student as his or her 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. Plagiarism is considered a serious act of academic misconduct and may result in a student receiving an F in the course and being suspended from The University. For more information, see <http://facultysenate.ua.edu/handbook/append-c.html>

#### Equal Treatment:

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 is not to 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 test. The test will run from 5:00 to 9:00 PM. If you need extra time you must come BEFORE 5:00 PM. I will not stay later than 9:00 PM.

**TEXTBOOKS**

None

**CALCULATOR**

You will need a calculator for this course. The recommended calculators are TI-34 II, TI 30X IIS, or TI 30X II b. you may use other calculators, however, I will only teach to the recommended ones. I will not take up class time for other calculators. You may come by my office before class or stay after class if you want help with your calculator.

**EVALUATION PROCEDURES**

**PERCENTAGES**

Test 1	100 points	90% - 100%	A
Test 2	100 points	80% - 89%	B
Class Points	25 points*	70% - 79%	C
Assignments 5 @ 30 points each	<u>150 points</u>	60% - 69%	D
Total	375 points	Below 60%	F

**ALL GRADED ASSIGNMENTS**

Since assignments are to be graded, students are expected to work on the assignments INDEPENDENTLY. Questions concerning the assignment 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. If you come by my office for help, I will work a similar problem, but not the sam problem that is on the assignment. It is not fair to the other students in the class to ask me to pregrade or work the problem for you outside of class. Please ask questions concerning your assignments in class so that other students can benefit as well. Any assignments that use SPSS® must have your name typed on the printout before printing.

**WARNING!!!! WHEN YOU TURN IN AN ASSIGNMENT MAKE SURE THAT YOU TURN IN EVERYTHING. FAILURE TO TURN IN ALL OF AN ASSIGNMENT WILL RESULT IN YOU MISSING THE POINTS DELEGATED FOR THAT PART. I WILL NOT ACCEPT MISSING PARTS AT A LATER DATE.**

**Class Points**

Class points are given at the discretion of the instructor. The points can be for participation, questions asked in class, reflective points, etc. In order to receive the points you must be in class.

These points can not be made up if you miss a class in which they are given.

\*If no class points are given during the semester, then the total possible points for the semester will be 350. I will inform you in class when I am taking class points.

### **SEMESTER GRADE**

The semester grade is final. There will be no changes except for cases of error in recording the grade and/or a mistake in grading on my part. If you fail to answer questions on the tests or on the assignments or do not turn in part of an assignment you will not be given a chance to redo. Please do not ask to redo an assignment or ask for extra credit assignments in order to elevate a grade. This is not fair to the other students in the class. Also, do not decide to turn in an assignment that you previously did not turn in after the due date. **FINAL GRADE MEANS FINAL GRADE.**

### **E Learning**

Handouts for the class can be found on E Learning. 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 E Learning. If your E Learning is not working properly, it is your responsibility to find out why and get the problem corrected. Failure to access E Learning 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 E Learning. **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 night'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 send all e-mails to [agodfrey@bama.ua.edu](mailto:agodfrey@bama.ua.edu). Please do not use other e-mail addresses to e-mail me. This may result in receiving a zero on an assignment in that I do not check other e-mail addresses. When e-mailing me please identify which class you are in. The way to do this is in the subject line put "BER 540G." 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.**

### **ASSIGNMENTS**

The following dates and assignments are subject to change.

<b>Date</b>	<b>Topics and Assignments</b>	<b>Chapter</b>
Jan 9	Introduction	1

	Terms Homework: Handout - Terms Frequency Distributions and Graphs; Skewness; Kurtoses Homework: Handout - Frequency Distributions	2 Pages 70-75
Jan 16	Central Tendency; Variation; Percentiles Homework: Handout on Central Tendency and Dispersion Homework: Handout on percentiles Computer lab	2, 3
Jan 23	Probability; Combinations; Permutations Homework: Handout <b>ASSIGNMENT 1 DUE</b>	5
Jan 30	Central Limit Theorem; Normal Distribution Homework: Handout <b>ASSIGNMENT 2 DUE</b>	4, 5
Feb 6	Confidence Intervals; Sample Size <b>ASSIGNMENT 3 DUE</b> Homework: Handout Review for test	5
Feb 13	Test 1 <b>ASSIGNMENT 4 DUE</b>	
Feb 20	Error; Power; Hypothesis Testing Homework: Handout	6, 7, 8
Feb 27	Hypothesis Testing Homework: Handout Computer Lab	6, 7, 8
Mar 5	Chi-Square Homework: Handout - Chi-Square Correlation and Regression Homework: Handout - Correlation and Regression Computer Lab	8 10, 11
Mar 12	Review <b>ASSIGNMENT 5 DUE</b>	
Mar 26	Test 2 <b>ASSIGNMENT 6 DUE BEFORE STARTING THE TEST</b>	

### **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>