

BER 540, Statistical Methods in Education
Tuscaloosa, 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 students will be able to find the confidence interval for the mean when σ is unknown or $n \leq 30$.
20. The student will be able to identify Type I and Type II errors.
21. The student will be able to interpret the level of significance.
22. The student will be able to state the null and alternative hypotheses.
23. The student will know the steps in testing hypotheses about the μ .
24. The student will be able to test inferences about a single mean.
25. The student will be able to test inferences about two independent samples using the mean.
26. The student will be able to test inferences about two dependent samples using the mean.
27. The student will be able to test inference about a single proportion.
28. The student will be able to test inferences about two independent proportions.
29. The student will be able to use the Chi-square Goodness-of-fit Test.
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 tests will be drawn from classroom lectures. 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. **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 over 1. If you are not going to be in class, assignments can be placed in my mailbox, brought to class 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.** 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 reason (including sports participation) you will take a comprehensive test at the scheduled time for test 2. The grade made on the comprehensive test will be the grade for both test 2 and the missed test. Since the comprehensive test is not the same test taken by the other students, any possible extra points added to either test 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. Please do not ask to take a test early or late.

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.

Accommodations:

To request disability accommodations, please contact the Office of Disability Services at 348-4285. It is located at 220 Research Drive, Box 870185. 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.

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

Test 1	100 points
Test 2	100 points
Project	150 points
Assignments 5 @ 30 points each	<u>150 points</u>
Total	500 points

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.

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 a complete 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.

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 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.** When e-mailing me, please send e-mails to agodfrey@bama.ua.edu. Please **DO NOT** use other e-mail addresses, this may result in you receiving a zero for a late assignment. Your e-mail should have in the subject line BER 540T and your name (first and last) at the end of the e-mail. Please do not e-mail me for grades. I return the graded assignments and tests at 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.**

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.

ASSIGNMENTS

The following dates and assignments are subject to change.

Date	Topics and Assignments
Jan 15	Introduction, Terms Frequency Distributions and Graphs; Homework: Handout Skewness; Kurtoses
Jan 22	Central Tendency; Variation; Percentiles; Computer Lab Homework: Handout on central tendency Homework: Handout on percentiles
Jan 29	Probability; Combinations; Permutations Homework: Handout ASSIGNMENT 1 DUE
Feb 5	Discrete Probability Distribution Binomial Distribution Hypogeometric Distribution Homework: Handout ASSIGNMENT 2 DUE
Feb 12	Central Limit Theorem; Normal Distribution Homework: Handout ASSIGNMENT 3 DUE
Feb 19	Review for Test 1

Feb 26	Confidence Intervals; Sample Size Homework: Handout
March 4	Test 1 ASSIGNMENT 4 DUE AT BEGINNING OF CLASS
March 11	Error; Power; Hypothesis Testing Homework: Handout
March 25	Hypothesis Testing; Computer lab Homework: Handout
April 1	Chi-Square Homework: Handout
April 8	Correlation and Regression; Computer lab Homework: Handout ASSIGNMENT 5 DUE
April 15	Review for test
April 22	TEST 2 ASSIGNMENT 6 DUE AT BEGINNING OF CLASS
April 29	PROJECTS DUE NO LATER THAN 6:30 PM IF LATE, A 10% LATE PENALTY WILL BE ACCESSED PLEASE TURN THEM INTO ME IN MY OFFICE AT 307C CARMICHAEL ANYTIME FROM 10:00 AM TILL 6:30 PM
	WARNING!!!! I WILL NOT ACCEPT AFTER APRIL 29

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>