ERMA 7300/7306

Design and Analysis 1

Fall 2010

EFLT
College of Education

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AUBURN UNIVERSITY
SYLLABUS

I. **Course Number:** ERMA 7300/ERMA 7306
Course Name: Design and Analysis in Education I
Credit Hours: 3 Semester Credit Hours
Prerequisite: FOUN7200 or Equivalent
Corequesite: None

Professor: David M. Shannon
4028 Haley Center, 4-3071, 4-3072 (FAX)
shanndm@auburn.edu

Office Hours: Wednesdays, 9-12, 3-4, and by appointment.

2. Date Syllabus Revised: August, 2010

3. Texts

Ross, M. E. & Shannon, D. M. (2008). Applied Quantitative methods in Education. Dubuque, IA: Kendall/Hunt Publishing Company. ISBN# 978-0-7575-5483-4

The following tests may be helpful and are on reserve in the Learning Resources Center (LRC) and selected chapters will be posted on the course Blackboard site.

Gravetter and Wallnau. (2009). Statistics for the Behavioral Sciences (8th edition). Belmont, CA: Wadsworth. ISBN# 0-495-60220-5

Huck. (2004). Reading research and Statistics (4th edition). Boston, MA: Pearson Education. ISBN # 0-205-38081-6

Salkind, N. J. (2010). Statistics for People (Who Think) They Hate Statistics. Thousand Oaks, CA: Sage Publications. ISBN# 978-1-4129-7102-7

Shannon and Davenport (2001). Using SPSS to Solve Statistical Problems. Columbus, OH: Merrill/Prentice Hall. ISBN# 0-13-267576-5

4. Course Description:

Basic methods of descriptive and inferential analysis including chi-square, t-tests, between and within subjects ANOVA, mixed ANOVAs and hierarchical designs as they are utilized in educational research.

5. Course Objectives:

Upon completion of this course, the student will be able to:

- explain the process of hypothesis testing and apply to research problems
- identify different types of research designs and variables found in published articles
- describe the strengths and limitations of different research designs
- identify applications of a wide variety of statistical procedures
- solve educational research problems using statistical tests of significance
- make accurate interpretations of statistical findings
- use data analysis software (SPSS/PASW) to solve statistical problems
- review published research literature to examine the application of measurement, design, and analysis procedures
- prepare a written summary of data analysis results in APA format

6. Course Content and Readings

Meeting Dates: **August 18, 25**
September 1, 8, 15, 22, 29
October 6, 13, 20, 27
November 3, 10, 17
December 1

Please read the assigned readings prior to class.

Content	**Readings (Additional readings found on course Blackboard site)**
A. Introduction Overview of Research Design Research Problems, Questions, Variables Sampling Issues Review of Descriptive Statistics	Ross and Shannon, Chapters 1-3 Gravetter and Wallnau, Chapters 1-6 Huck – Chapters 1-2 Salkind, Chapter 1, 1a, 2, 3, 4 Shannon and Davenport, Chapters 1-9
B. Reliability and Validity Types of reliability and validity Factors influencing reliability and validity	Ross and Shannon, Chapter 15 Huck – Chapter 4 Salkind, Chapters 5,6 Shannon, Chapter 10
C. Hypothesis Testing and Decisions Probability Hypothesis Testing Power, Effect Size Type 1 and Type 2 error	Gravetter - Chapters 7-8 Huck – Chapters 5 – 9 Salkind, Chapters 7, 8, 9 Shannon, Chapter 11

D. Nonparametric Statistics Chi-Square Binomial test	Gravetter, Chapters 18, 19 Salkind, Chapter 16 Other Readings posted on Blackboard
E. One Sample Tests of Significance One-sample *z*-test One-sample *t*-test Dependent t-test Measurement and Research Design Issues	 Ross and Shannon – Chapter 4 Gravetter - Chapters 9-11 Huck – Chapter 10 Shannon, Chapters 15, 18
F. Two Sample Tests of Significance Two-sample *z* test Two-sample *t*-test Confidence Intervals Measurement and Research Design Issues	Ross and Shannon, Chap. 5 Gravetter – Chapter 10 Huck – Chapter 11 Salkind, Chapter 10 Shannon – Chapter 15
G. Single Factor (ONEWAY) ANOVA Assumptions of ANOVA Planned Comparisons Post-Hoc Comparisons Measurement and Research Design Issues	Ross and Shannon, Chap. 6 Gravetter – Chapter 13 Huck – Chapter 13 Salkind, Chapter 12 Shannon – Chapter 16
H. Factorial ANOVA Designs Two Factor Designs Main and Simple Effects Interaction Effects Designs with Unequal Sample Sizes Disproportionality Three or more Factor Designs Measurement and Research Design Issues	Ross and Shannon, Chap. 7 Gravetter – Chapter 15 Huck – Chapter 14-15 Salkind, Chapter 13 Shannon – Chapter 17
I. Within Subjects Designs Assumptions of Within-Subjects Designs Single Factor Repeated Measures Designs Two Factor Repeated Measures Designs Measurement and Research Design Issues	Ross and Shannon, Chap. 8 Gravetter – Chapter 14 Huck – Chapter 16 Salkind, Chapter 11,17 Shannon – Chapter 19
J. Mixed ANOVA Designs Assumptions One Between and One Within Models Multiple Mixed Variables Measurement and Research Design Issues	Ross and Shannon, Chap. 9 Huck – Chapter 17 Salkind, Chapter 17 Shannon – Chapter 20

7. Course Requirements:

A. Attend all class sessions and participate in class discussions and activities
B. Complete all announced and unannounced quizzes
C. Complete all examinations
D. Complete all homework assignments

8. Grading and Evaluation Procedures:

	Percentage of Final Grade
Attendance/Participation	5%
Quizzes	30%
Examinations	40%
Homework assignments	25%

Students missing more than 20% of course meetings will have their final grade reduced by one letter grade.

Any assignment presented or turned in late will be penalized 5% for each day past the assignment deadline. Assignments more than 2 weeks overdue will not be accepted

The following grading scale will be used:

90% B 100% = A
80% B 89.99% = B
70% B 79.99% = C
60% B 69.99% = D
Below 60% = F

Class and Group Participation (5% of grade)

In order to explore topics effectively, attendance and class participation are essential. The evaluation of class participation will be made as follows.

a. Attendance. You are expected to attend class and be on time (allowing for a standard error of 10 minutes). Should you not be able to attend class (and you have a valid excuse), you are responsible for making arrangements to complete that week's responsibilities. Each unexcused absences or lateness will result in a deduction of 2 points from your final grade.

b. Readings and Class Preparation. You must complete the assigned readings prior to each class meeting. To prepare for each class, you are expected to prepare at least one written question or valid criticism/concern you have about the week's readings. These questions/comments must be submitted to me at least one day prior to each class meeting. I will also accept these via email, FAX, USPS, carrier pigeon, or singing telegram. Late submissions will not be accepted for credit.

Quizzes (30%)

There will be 3-5 quizzes over the duration of the semester. These quizzes will cover the concepts explored in class. These are to be completed without the assistance on

any resources.

Examinations (40%)

There will be two examinations. These exams will be take-home and you will have one week to complete them. You are encouraged to use materials from class (handouts, readings, etc..) as you work on these exams.

Homework Assignments (25%)

There will be 3-5 homework assignments throughout the semester. These assignments will focus primarily on the application of statistical software to perform procedures addressed in class. I will always illustrate an application prior to requiring of you for homework. We will illustrate and use SPSS in class. SPSS is loaded on several computer labs on campus (LRC, Wallace, etc..) and is available for purchase at a student rate. If you have access to a different software and can use it to accomplish the same outcome, great.

9. Class Policy Statements:

A. Students are expected to attend all class meetings and participate in class activities (Tiger Cub, page 73). Should students need to be absent from a class for whatever reason, they are expected to contact the instructor in advance.

B. Students are responsible for initiating arrangements for missed work due to excused absences (Tiger Cub, page 74).

C. Students who need special accommodations should make an appointment to discuss the Accommodation Memo within the first 2 weeks of class. If you do not have an Accommodation Memo, please contact Dr. Kelly Haynes, Director, Program for Students with Disabilities, 1244 Haley Center, (334) 844-2096.

D. All portions of the Auburn University Honesty Code found in the Tiger Cub (Title XIII) will apply to this class.

E. The Computer classrooms have a no food and drink policy. There is an exception for bottled water, which should remain sealed when not being consumed. If laptops are present, bottled water should be kept away from laptops. This policy is to ensure the room remains free from liquid stains and food crumbs that result in room repairs or the expense of spraying for roaches. With the room being a technology room, it falls under OIT policy and violators can lose campus computer privileges (e-mail & WebCT access) if not adhering to this policy. If accommodations are needed, please inform the LRC staff. Thank you for your cooperation.

ERMA 7300/7306 Student Information – Fall 2010

Place a picture of yourself here. This picture may be copied from you AU ID, passport, driver's license, mug shot from the post office, or self-drawn.

Name:

Major:

Advisor:

Contact Information
(phone, email, etc…)

Background in Research and Statistics

Describe your research interests.

How do you expect to apply this course to your specialty area?

Assignment:

Please write a brief autobiography (approximately 1-2 pages). Describe yourself in terms of your background, why you decided to enroll in graduate school, your career aspirations, your favorite statistical procedure(s), what you like best about Penn State football, or anything else of interest to you (or me). If you **have** been in one of my classes before, please feel free to take this opportunity to either verify what you said before was true or make up some more exciting things about yourself.