

1. ERMA 7300

Design and Analysis I

3 credit hours

2. Semester Fall 2014

Meeting Time: Mondays from noon to 2:50 PM

Room: Haley Center

Instructor: Margaret E. Ross

4018 Haley Center

(334) 844-3084 rossma1@mail.auburn.edu (the first 1 = one)

Office Hours: Tuesdays 3-5 PM and Wednesdays 10 AM to noon

3. Resources

Ross, M. E. & Shannon, D. M. (2008). Applied Quantitative Methods in Education. Kendall/Hunt, Publishing Company, Dubuque, Iowa. (You can order directly from Kendall/Hunt)

Publication Manual of the American Psychological Association. Washington D.C., American Psychological Association.

4. Course Description

This course is designed to provide students the understanding of statistical methods pertaining to the design and analysis of experiments in educational research. Descriptive statistics will be reviewed and inferential statistics used to analyze the relationship between one or more categorical variables and a continuous variable will be studied. This course emphasizes the conceptual application of statistics with little emphasis placed on the mathematical derivation of the formulas. Emphasis will be placed on conceptual understanding of t-test and ANOVA designs, correctly identifying the proper statistical test, and interpreting the output using SPSS for Windows.

5. Course Objectives

Students will:

- Gain an understanding of inferential statistics.
- Apply knowledge of inferential statistics by analyzing research problems and making decisions about the appropriate use of inferential procedures.
- Apply knowledge of inferential statistics using SPSS to determine significance.
- Apply knowledge of inferential statistics by interpreting results of statistical analyses.
- Interpret the results of the analyses in terms of the research hypothesis

6. Tentative Course Content and Schedule

Class 1 1/14

Introduction to the Course/Syllabus

Basics of Statistics

Introduction to Research Design

Overview of T-test and ANOVA designs

Computer Activity/Lab

Authentic Project

Class 2 1/21

Measures of Central Tendency (review)

Measures of Variability (review)

Distributions

Overview of T-test and ANOVA designs

Authentic School Based **Project (a 'real' problem or issue in a school that needs to be addressed)**

Research Project planning (pairs)

Readings and Assignment

Introduction

Chapters 2 and 3

Computer Activity/Lab

Class 3 1/28

Review

Topics

Validity and Reliability

Internal/External validity

Readings and Assignment

Chapter 15

Prepare for Exam

Class 4 2/4

Exam 1

Class 5 2/11

Class Discussion of Team Projects (project questions, data collection, analyses)

Topics

Z-test and Hypothesis Testing (an eight step approach)

One-sample t-test

Research Project Planning/Guidance

Readings and Assignment

Chapter 4

Research Article/Z-test or One-sample t-test

Class 6 2/18

Review and Article Discussion

Topics

One-way ANOVA

Independent Samples t-test

Research Project Planning/Guidance

Readings and Assignment

Chapters 5

Lab Activity

Research Article/Independent Samples t-test

2/25 No class (conference)

Class 7 3/4

Review and Article Discussion

Rubrics for research project distributed/discussed

Planned Comparisons (follow-up)

Post-Hoc Comparisons

Research Project Planning/Guidance

Readings and Assignment

Chapter 6

Lab Activity

Research Article/One-Way ANOVA with post-hoc Analyses

Class 8 3/11

Test Preparation

Class 9 3/18

Exam 2

3/25 No class (spring break)

Class 10 4/1

Review and Article Discussion

Topics

Two-way ANOVA/Three-way ANOVA

Follow-up analyses to multi-way ANOVA (simple effects, interaction contrasts)

Research Project Planning/Guidance

Readings and Assignment

Chapter 7

Lab Activity

Research Article/Two-Way ANOVA

Class 11 4/8

Review and Article Discussion

Topics

Paired Sample t-test

Within Subjects Designs

Mixed designs

Non-parametric analyses

Chi Square

Binomial

Research Project Planning/Guidance

Readings and Assignment

Chapter 8

Lab Activity

School Based Research Article/Paired Sample t-test or Within Subjects Design

Authentic Project Plan DUE

Class 12 4/15

Preparation for exam

Class 13 4/22

Exam 3

Thanksgiving Break 11/25

Class 14 4/29

Authentic Project Presentations

7. Course Requirements and Evaluation

Learning Methods

Lectures, discussions, readings, class exercises and lab assignments.

*Student Assessment**

Three Tests	65% (20% test 1, 20% test 2, and 25% test 3)
Authentic Research Project	20%
Presentation**	05%
Assignments	10%

You can work in pairs on lab assignments and turn in one lab assignment per pair if you wish. *You CANNOT make up more than two lab assignments.*

See next page for research project outline

Research Project

Introduction (no more than 2 page)

- A. Statement of Problem
- B. Significance of problem (based on stated needs of school personnel and/or literature review)
- C. Specific research questions to be answered.
 1. Are they clearly stated?
 2. Are they feasible/legitimate?
 3. Does it lend itself to t-test or ANOVA procedures?

Methodology (approximately 1 to 2 pages)

- A. Full description of participants
- B. Instrumentation (Validity and Reliability important here!)
- C. Procedures (detailed description of what you did – step by step)
- D. Data processing and analysis (how will you analyze the data and why)?

Results (approximately 1 page)

- A. Are **all** appropriate statistics clearly stated in APA style?
- B. Are tables or graphs appropriately used?

Discussion (approximately 2 page)

- A. Results in words
- B. Recommendations
- C. Limitations discussed

A more detailed rubric will be handed out closer to the time the proposal and presentation are due.
The paper is to be written in APA style.

Grading Scale

- A: 90 – 100% and excellent attendance (absent no more than two classes)
B: 80 – 89% and good attendance (absent no more than three classes)
C: 70 – 79%
D: 60 – 69%
F: below 60%

8. Class Policy Statements

Attendance Policy

- I will start class on time so if you are late you will need to get notes from another student.
- I will allow only two lab make-ups. If you miss more classes you will not be able to earn the points for the missed lab(s).

Late Assignments Policy

- Assignments turned in late will receive a 2% reduction in earned points per day. The only exception will be in the case of emergency.
- Except for work requiring calculations, all work must be typed or it will not be graded. Late penalty will be applied to work completed in writing and then turned in late in typed format for a grade.

Incompletes and Withdrawals

Grades associated with incomplete course work or withdrawal from class will be assigned in strict conformity to University policy (see Auburn University Bulletin). If you wish to drop this course you may do so by the 10th class day with no grade assignment. From the 10th class day to mid-quarter a W (withdrawn-passing) grade will be recorded in your transcripts. After this period withdrawal from the course will only be granted under unusual circumstances and must be approved by the Dean of the College of Education.

Note that a new incomplete grade (IN) policy is in effect. The new policy requires that students complete a form requesting that an IN grade be assigned. If this form is not completed and given to the instructor of the class, a grade will be assigned with a score of zero (0) for work that has not been completed and turned in by the time the instructor reports grades.

Academic Misconduct

The Department of EFLT recognizes university policy regarding academic misconduct. Violations include, but are not limited to: plagiarism, unauthorized assistance during examinations, submitting another's work product as your own, using another's words as your own without appropriate citation, sharing unauthorized materials with another that contain questions or answers to examinations, altering or attempting to alter assigned grades. In accordance with University policy regarding academic misconduct, students may be subject to several sanctions upon violations of the Student Academic Honesty Code. See the Tiger Cub publication for the current year for specifics regarding academic misconduct as well as student's rights and responsibilities associated with the Code.

Disability Accommodations

Students who need accommodations are asked to arrange a meeting with me as soon as possible. If you have a conflict with my office hours, an alternate time can be arranged. To set up this meeting, please contact me by e-mail. Bring a copy of your Accommodation Memo and an Instructor Verification Form to the meeting. If you do not have an Accommodation Memo but need accommodations, make an appointment with The Program for Students with Disabilities, 1244 Haley Center, 844-2096.