

1. **ERMA 8320**  
**Design and Analysis in Education III**  
3 credit hours  
Prerequisite: ERMA 7300 Design and Analysis in Education I  
ERMA 7310 Design and Analysis in Education II
  
  2. **Semester FS 2012**  
Meeting Time: Mondays 4:30 PM  
Instructor: Margaret E. Ross  
4018 Haley Center  
(334) 844-3084  
[rossma1@auburn.edu](mailto:rossma1@auburn.edu) (the first 1 = one)  
Office Hours: Mondays 2-4 PM, Tuesdays 3-4:30 PM, by appointment
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### 3. Resources

Mertler, Craig A. and Vannatta, Rachel A. (2010). Advanced and Multivariate Statistical Methods: Practical Application and Interpretation. Pyrczak Publishing, Los Angeles.

Publication Manual of the American Psychological Association (any recent edition). 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 educational research. Various Multivariate techniques will be presented, including Canonical and Discriminate Regression, Logistic Regression and Loglinear Regression, Path Analysis and Factor Analysis, Multivariate Analysis of Variance, and Hierarchical Linear Modeling. This course emphasizes the conceptual application of statistics with some emphasis placed on the mathematical derivation of the formulas to facilitate understanding of the statistics. A part of the course will be learning SPSS as it pertains to correlation and regression and learning to interpret output.

### 5. Course Objectives

Students will:

- Gain an understanding of multivariate procedures.
- Apply knowledge of multivariate procedures by analyzing research problems and making decisions about the appropriate use of these procedures.
- Apply knowledge of multivariate analyses using SPSS. (Technology)
- Apply knowledge of multivariate procedures by interpreting results of statistical analyses.
- Interpret the results of the analyses in terms of the research hypothesis.

## **6. Tentative Course Content and Schedule**

Week 1 8/20

Overview of Multivariate Statistics

Large Scale Data Sets

Assignment: Explore Data Sets

Week 2 8/27

Review

ANOVA

Regression

Data Exploration

Working with Large Scale Data Sets Continued

Assignment: Define Research Questions/Hypotheses for Project (due next week)

Week 3 9/10

Research Questions/Hypotheses for Project due

Data Screening

Matrix Algebra

MANOVA with 2 and 3 groups

Hotellings T squared

Guided Lab Practice

Data Transformations

MANOVA

Assignment: One way MANOVA article

Assignment: End of Chapter Exercises (Chapter 6, due week 6)

Week 4 9/17

MANOVA Article Review Due

Maximum Likelihood

MANOVA ...factorial

Week 5 9/24

Factorial MANOVA article

Discriminate and ANOVA as follow-up

Canonical regression

Follow up article or example MANOVA with follow-ups

Assignment: Chapter 6 Exercises continued

Week 6 10/1

Chapter 6 Exercises Due

Factorial MANOVA Summary Due

Review for Test

ANOVA

Regression

Data Cleaning and Transformations

MANOVA

Week 7 10/8

Test

Week 8 10/15

Path Analysis

Assignment: Exercises for Chapter 8( due week 9)

Week 9 10/22

Exercises for Chapter 8 Due

Exploratory Factor Analysis

Confirmatory factor analysis

Assignment: Exercises for Chapter 9 (due week 10)

Week 10 10/29

Exercises for Chapter 9 Due

Logistic regression

Log linear

Assignment: Article for one of the following: Factor Analysis, Path Analysis, Logistic Regression, Loglinear Regression (due week 11)

Assignment: Exercises for Chapter 11

Assignment: Projects due week 12

Week 11 11/5

Exercises for Chapter 11 Due

Hierarchical Linear Modeling

Introduction and Notation

Introduction to Models

Assignment: Projects due week 12

Assignment: Article on Hierarchical Linear Modeling (due week 12)

Week 12 11/12

Project Due

Review

Hierarchical Linear Modeling (HLM)

Models Continued

Review for Test

Week 13 11/26

Test

Week 11/19 Thanksgiving Break

Week 14 12/3

Round Tables

## **7. Course Requirements/Evaluation**

### *Learning Methods*

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

### *Student Assessment*

Two Tests	50% (25% each)
Project Paper	30%
Project presentation/submission plan/Power Point	10%
Assignments/labs (2 makes up allowed)	10%

### *Lab*

- Lab is designed to introduce you to the use of SPSS to complete analyses taught in class. Due to time restraints, it is NOT intended to provide you with enough practice to memorize procedures. You should have reference books to help you complete analyses via SPSS when you do are completing analyses on your own.
- Sometimes the lab will double as an assignment and must be turned in at the end of the lab session. In this case, you will need to have the output printed. You can work in pairs on lab assignments and turn in one lab assignment per pair if you wish.

### *Attendance*

Points are not attached to attendance directly. However, excellent class attendance is expected. If you need to be absent for school or work-related requirements, illness, or an emergency, you are allowed to make up points for no more than two classes. Students are responsible for initiating arrangements for missed work.

### *Proposal and Presentations*

The following is the outline that will be used for this assignment. You must use a correlation/regression design taught in this class. If you do not use a correlation/regression design, I will not accept the paper.

*Use the following major sections:*

#### *Introduction Section*

- Argument of worth or purpose of the study
- Literature - Integrated by themes/points made
- Hypothesis or research question - written first but presented at the end of the literature section

#### *Methodology Section*

- Participants (descriptive statistics)
- Measures (Validity and Reliability important here! - describe scale(s), composite scores, how scores are used in the study)
- Procedures (detailed description of what you did step by step, data processing and analysis - how will you analyze the data and why)?

#### *Results Section*

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

*Discussion Section (Discussion is the major heading, the following information should be included in this major section)*

- State results in words
- Discuss Limitations, including statistical assumptions

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%
B:	80 – 89%
C:	70 – 79%
D:	60 – 69%
F:	below 60%

## 8. Class Policy Statements

*Class Attendance (see attendance requirements under section 7 above)*

### *Late Assignments Policy*

- Assignments turned in late will receive a 3% 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.

### *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 special accommodations in class, as provided for by the American Disabilities Act, should arrange a confidential meeting with the instructor during office hours the first week of classes - or as soon as possible if accommodations are needed immediately. You must bring a copy of your Accommodation Memo and an Instructor Verification Form to the meeting. If you do not have these forms but need accommodations, make an appointment with the Program for Students with Disabilities, 1244 Haley Center, 844-2096.