AUBURN UNIVERSITY
SYLLABUS

I.   **Course Number:**   ERMA 7310/7316
        Course Name: Design and Analysis in Education II
        Credit Hours: 3 Semester Credit Hours
        Prerequisite: FOUN7300 , 7306 or Equivalent
        Professor: David M. Shannon
                           4028 Haley Center, 4-3071, 4-3072 (FAX)
                           shanndm@auburn.edu
        Office Hours: Wednesdays 8-11AM, 3-4PM, and by appointment

2.   **Date Syllabus Revised:**   **January 2011**

3. **Texts**

Ross, M. E. & Shannon, D. M. (2008). Applied Quantitative methods in Education. Dubuque, IA: Kendall/Hunt Publishing Company.

Recommended Textbook

- Pedhauzer, E. J. (1997). *Multiple Regression in Behavioral Research* (3rd edition). Orlando, FL: Harcourt Brace & Company. Wadsworth Publishing; # ISBN-10: 0030728312 & # ISBN-13: 978-0030728310

Recommended Software:

- **SPSS Graduate Pack.** SPSS is loaded on several computer labs on campus (LRC, Wallace, etc.) Please contact Auburn University campus Bookstore at 334-844-1692 or AUBookstore@auburn.edu to order your copy. You also have the option to purchase it on-line at www.journeyed.com or lease a copy for 6 or 12 months at www.e-academy.com.

Other Resources:

- Cohen, J. & Cohen, P. (1983). *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*, (2nd edition). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Grimm, L. G. & Yarnold, P. R. (Eds.). (1995). *Reading and Understanding Multivariate Statistics*. Washington, DC: American Psychological Association.
- Keppel, G. & Zedack, S. (1989). *Data Analysis for Research Designs: Analysis of Variance and Multiple Regression Approaches.* New York: W. H. Freeman and Company.
- Shannon, D. M. & Davenport, M. (2001). *Using SPSS to Solve Statistical Problems: A self-instruction guide.* Columbus, OH: Merrill/Prentice Hall.
- Huck. (2007). *Reading research and Statistics* (5th edition). Boston, MAS: Pearson Education. ISBN # 0-205-38081-6

4.   Course Description:

This course is a study of bivariate and multiple correlation and regression analysis with continuous and categorical variables, trend analysis, analysis of covariance, logistic regression, and path analysis. Measurement and design issues will be addressed as they impact these analytical procedures. In addition, the use of statistical software - Statistical Package for the Social Sciences (SPSS) will be heavily integrated with course content.

5.   Course Objectives:
        Upon completion of this course, the student will be able to:

1. Identify different types of research designs and variables found in published articles
2. Describe the strengths and limitations of different correlational research designs
3. Identify applications of a wide variety of correlation and regression procedures
4. Explain the least squares concept in correlation and regression analysis
5. Describe differences and applications of stepwise, simultaneous, and hierarchical multiple regression using examples from educational research
6. Apply regression analysis to educational research problems involving quantitative, qualitative, and a mixture of both quantitative and qualitative independent variables
7. Determine the statistical power associated with a variety of correlation and regression applications
8. Solve educational research problems using correlation and regression analysis
9. Make accurate interpretations of statistical findings from correlation and regression analysis
10. Use data analysis software (SPSS) to solve statistical problems
11. Review published research literature to examine the application of measurement, design, and analysis procedures
12. Prepare a written summary of data analysis results in APA format

6.   Course Content and Readings

Meeting Dates: **January 12, 19, 26**
                       February 2, 9, 16, (23)
                       March 2, 9, (16), 23, 30
                       April 6, 13, 20, 27

Topic	Readings ERMA 7310 – Page 3

1. Introduction – Correlation and Regression Analysis
   • Covariance and Correlation
   • SPSS **X**Y Scatterplot
	• Read Ross/Shannon – Ch. 10
	• Optional readings:
	  Pedhauzer, Ch. 1
	  Grimm & Yarnold, Ch. 1
	  Huck, Ch. 1, 3
	  Shannon & Davenport Ch. 12, 13, 14

2. Bivariate Correlation and Regression
   • SPSS – Intro. Correlation Regression
	• Ross/Shannon – Ch. 10
	• Optional Readings
	  Pedhauzer, Ch. 2
	  Huck, Ch. 3, 9
	  Shannon & Davenport Ch. 21

3. Introduction – Multiple Correlation and Regression
   • Residual Analysis
	• Read Ross/Shannon – Ch. 11
	• Optional readings
	  Pedhauzer, Ch. 3 & 5
	  Grimm & Yarnold, Ch. 2
	  Huck, Ch. 16
	  Shannon & Davenport Ch. 22

4. Partial and Semi-partial Correlation
   • Multiple Regression
	• Read Ross/Shannon – Ch. 12
	• Optional Readings
	  Pedhauzer, Ch. 7
	  Huck, Ch. 16

5. Multiple Regression – Three or more Independent Variables	• Ross/Shannon – Ch. 12 • Optional readings Pedhauzer, Ch. 8
6. Analytic Strategies – Regression Analysis	Read Pedhauzer, Ch. 9

7. Multiple Correlation and Regression – Categorical Independent Variables
   • Categorical Predictors
   • Criterion Coding
	• Pedhauzer, Ch. 10 & 11
	  Shannon & Davenport Ch. 23

8. Regression – Analysis of Variance (ANOVA) Designs • Categorical Predictors	• Read Pedhauzer, Ch. 12

9. Analysis of CoVariance (ANCOVA)
   • SPSS_ANOVA
	• Read Ross/Shannon – Ch. 13
	• Optional Readings
	  Pedhauzer, Ch. 14 & 15
	  Huck, Ch. 15

10.   Curvilinear Regression
   • Curvilinear Relationships
   • SPSS - Curve Regression
	• Read Pedhauzer, Ch. 13

11.   Logistic Regression
   • SPSS –Logistic Regression – one IV
   • SPSS - Logistic Regression – Multiple IVs
	• Read Pedhauzer, Ch. 17
	  Grimm & Yarnold, Ch. 7
	  Huck, Ch. 16

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 exercises
E.   Complete all computer exercises

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 <u>one</u> 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. <u>Attendance.</u> 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. <u>Readings and Class Preparation.</u> 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 7310/7316 Student Information – Spring 2011

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.