Syllabus

Course Number: ERMA 8320

Course Title: Design and Analysis in Education III

Semester: Summer, 2010

Credit Hours: 3 credit hours

Prerequisites: ERMA 7300/7306, ERMA 7310/7316

Meeting Time: Tuesdays 4:00~8:00

Instructor: Chih-hsuan Wang
3442 Haley
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Office Hour: Tuesday 2:00~4:00
Wednesday 2:00~4:00

Date Syllabus Prepared: May, 2010

Texts:

Required:

Mertler, Craig A., & Vannatta, Rachel A. (2009). *Advanced and Multivariate Statistical Methods: Practical Application and Interpretation (4th ed.).* Pyrczak Publishing, Los Angelas.

Recommended:

Meyers, L. S., Gamst, G., & Guarino, A. J. (2006). *Applied Multivariate Research: Design and Interpretation*. Thousand Oaks, CA: Sage Publications, Inc.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics (5th ed.).* Boston, MA: Pearson Education.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate Data Analysis (6th ed.).* Upper Saddle River, NJ: Person Education.

American Psychology Association (2009). *Publication Manual of the American Psychological Association (6th ed.)*. Washington D.C., American Psychological Association.

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 Multivariate Analysis of Variance (MANOVA), Canonical correlation, Discriminate function analysis (DFA), Factor Analysis (EFA and CFA), Path Analysis, Structural Equation Modeling, and Hierarchical Linear Modeling. If there is enough time, Logistic Regression and Loglinear Regression will be introduced at the end of the semester as well. 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.

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.

Tentative Course Content and Schedule

Week	Date	Reading & Class activities
1	05/25	Syllabus & Introduction Review ANOVA, correlation, and Regression
2	06/01	Chapter 3 Pre-Analysis Data Screening Other reading assignments will be sent out via e-mail Review Repeated measurement, and ANCOVA Assumptions and Data Transformation Mediator and Moderator Matrix Algebra
3	06/08	Chapter 6 Multivariate Analysis of Variance and Covariance MANOVA
4	06/15	Chapter 6 Multivariate Analysis of Variance and Covariance MANOVA and MANCOVA
5	06/22	Assignment #1 due Reading assignments will be sent out via e-mail Canonical Correlation
6	06/29	Chapter 10 Discriminant Analysis Discriminant Function Analysis
7	07/06	Assignment #2 due Chapter 9 Factor Analysis Exploratory Factor Analysis Reliability Analysis Instrument/measurement issues
8	07/13	Assignment #3 due Reading assignments will be sent out via e-mail Introduction to Confirmatory Factor Analysis
9	07/20	Reading assignments will be sent out via e-mail Introduction to Path Analysis and SEM

Week	Date	Reading & Class activities
10	07/27	Assignment #4 due Reading assignments will be sent out via e-mail Introduction to HLM
11	08/03	Article Critique due Article Critique Presentation

Course Requirements/Evaluation

- Learning Methods

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

- Student Assessment

Assignments (4 assignments)	20% each
Article critique	15%
Finding Articles	5%

- Lab
  1. 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.
  2. 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.

- Grading Scale

  A: 90 – 100%

  B: 80 – 89%

  C: 70 – 79%

  D: 60 – 69%

  F: below 60%

- Assignments (80% total, 20% each)
  1. MANOVA
  2. Discriminant function analysis
  3. Exploratory factor analysis and internal consistency reliability
  4. Confirmatory factor analysis and structural equation modeling

- Article Critique (15%)

  Students are expected to write an article critique. The data analysis technique in the research article has to be one of the topics discussed in this semester.

- Finding Articles (5%)

  Students are expected to find an article for each topic in this class. The data analysis technique in this article has to be the method discussed in the previous class. Students are expected to briefly present the research (about 5 minutes) at the beginning of the class.

Class Policy Statements

Class 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.

Assignment Policy

- Due to the potential incompatibility of word processing programs and formats, and the potential for the transmission of viruses, absolutely no work for the course will be accepted as an E-mail and/or as an E-mail attachment, or on a disk etc. All graded work must be printed off by you and delivered to me in hard copy format.
- All work submitted for the course must be typed.

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.

NOTE: This is a tentative syllabus. Any changes will be announced in class. Students are responsible for being aware of the changes made.