University of Texas at Austin

Department of Educational Psychology

EDP 382K—Survey of Multivariate Methods

EDP 382K—Survey of Multivariate Methods Fall 2013	
Instructor: Keenan Pituch, Ph.D.	*Meeting Times*: T, TH: 9:30 – 11:00
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I.   Course Description

There are many research situations in which multiple variables must be simultaneously analyzed. Some examples (with the likely required analysis technique in parentheses) are:

- Compare the impact of different instructional approaches (or treatments) on multiple student outcomes (multivariate analysis of variance or MANOVA).

- Determine if responses to a survey instrument are due to a smaller set of underlying factors (exploratory factor analysis).

- Determine if group differences on a set of variables can be reduced to a smaller number of variates that best differentiate or discriminate groups (discriminant analysis).

- Assess the impact of one or more explanatory variables on a dichotomous outcome and/or assess the accuracy of a procedure that is used to classify cases into one of two groups (logistic regression).

- Determine if a proposed causal model is supported by the data (path analysis).

II.   Course Goals

The goals of this course are to provide students with an understanding of the principles underlying commonly used multivariate statistical methods. Specifically, students will learn to select an appropriate analysis method given a research design and questions of interest, develop a working knowledge of how to analyze data with multivariate methods, and be able to properly interpret and communicate analysis results. Emphasis will be placed on helping students develop a conceptual understanding of multivariate analysis models, acquire generally accepted data analysis practices, and interpret analysis results.

III.   Textbook

The textbook adopted for this course is:

Stevens, J. (2009). *Applied Multivariate Statistics for the Social Sciences* (5th ed.). New York: Routledge.

IV.   Topics

The major topics to be considered in this course are:

1.   One-Way Multivariate Analysis of Variance (MANOVA)
2.   Exploratory Factor Analysis
3.   Discriminant Analysis
4.   Logistic Regression Analysis
5.   Path (or mediation) Analysis

V.   Requirements

1. Test 1
2. Test 2
3. Test 3
4. Test 4

The tests will cover instructional objectives as provided in class. The format of the test questions will be short answer and essay. **There is no extra credit**.

VI.   Grading Scale

The grade you receive for this course will be based on the percent of points you obtain on the tests. All exams are weighted equally, each comprising 25% of your total course score. Your course average score is computed as the average of the test scores (percent correct), with the course grade based on the ranges below.

A	93-100%
A-	90-92%
B+	87-89%
B	83-86%
B-	80-82%
C+	77-79%
C	73-76%
C-	70-72%
D	66-69%
F	< 66%

VII. Course Schedule and Policies

A. Tentative Course Schedule

Date	Unit	Readings
August 29	Introduction and Matrix Algebra	Ch. 1 and Ch. 2
September 3, 5	Two- and K-Group MANOVA	Ch.2, 4, and 5
September 10, 12	K-Group MANOVA	Ch.5 and Ch.6
September 17, 19	K-Group MANOVA and **Test 1 (19th)**	Ch. 6
September 24, 26	Exploratory Factor Analysis (EFA)	Ch. 11 and on-line materials
October 1, 3	EFA and Discriminant Analysis (DA)	
October 8, 10	DA	
October 15, 17	**Test 2 (15th)** and Logistic Regression	On-line materials
October 22, 24	Logistic Regression	
October 29, 31	Logistic Regression	
November 5, 7	**Test 3 (5th)** and Path Analysis	
November 12, 14	Path Analysis	On-line materials
November 19, 21	Path Analysis	
November 26, 28	Path Analysis (*Thanksgiving* on 28th)	
December 3, 5	Path Analysis and **Test 4 (5th)**	

B. Policies

The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity and responsibility. Each member of the University is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.

The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. For more information, contact the Office of the Dean of Students at 471-6259, 471-4641 TTY. If they certify your needs, I will work with you to make appropriate arrangements.

A student who misses an examination, work assignment, or other project due to the observance of a religious holy day will be given an opportunity to complete the work missed within a reasonable time after the absence, provided that he or she has properly notified the instructor. It is the policy of the University of Texas at Austin that the student must notify the instructor at least fourteen days prior to the classes scheduled on dates he or she will be absent to observe a religious holy day. For religious holy days that fall with the first two weeks of the semester, the notice should be given on the first day of the semester. The student will not be penalized for these excused absences, but the instructor may appropriately respond if the student fails to complete satisfactorily the missed assignment or examination within a reasonable time after the excused absence.