University of Texas at Austin

Department of Educational Psychology

EDP 380C 12—Survey of Multivariate Methods

EDP 380C 12—Survey of Multivariate Methods Spring 2016	
Instructor: Keenan Pituch, Ph.D.	*Meeting Times*: T, TH: 12:30 – 2:00
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TA: Rebecca Steingut	*Office Hours*: T 11:30 am to 12:30 pm; T 2:00 pm to 3:00 pm; other times by appointment.
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I. Course Description

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

- Compare the impact of different treatments on multiple outcomes (multivariate analysis of variance or MANOVA, multivariate mixed modeling).
- Compare the impact of different treatments using a priori planned comparisons or when outcome data are partially missing (multivariate planned comparisons, multivariate mixed modeling).
- 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).
- Model the associations between each of several predictors and a dichotomous outcome and/or assess the accuracy of a procedure that is used to classify cases into one of two groups (logistic regression).

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:

Pituch, K. A., & Stevens, J. P. (2016). *Applied multivariate statistics for the social sciences: Analyses using SAS and IBM's SPSS* (6th ed.). New York: Routledge.

IV. Topics

The major statistical techniques covered in this course are:

1. One-Way Multivariate Analysis of Variance (MANOVA)
2. A Priori Planned Comparisons
3. Multivariate Mixed Modeling
4. Exploratory Factor Analysis
5. Discriminant Analysis
6. Logistic Regression 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 one quarter 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
January 19, 21	Introduction and Matrix Algebra	Ch. 1 & Ch. 2
January 26, 28	Two and K-Group MANOVA	Ch. 4 (4.1-4.6) and Ch. 5 (5.1-5.6)
February 2, 4	K-Group MANOVA	Ch. 5 (5.13-5.15) and Ch. 6
February 9, 11	K-Group MANOVA, **Test 1 (Feb. 11th)**	
February 16, 18	Planned Comparisons	Ch. 5 (5.7-5.11)
February 23, 25	Multivariate Mixed Modeling (MVMM)	Ch. 14 (14.1-14.6)
March 1, 3	MVMM	
March 8, 10	**Test 2 (March 8),** Exploratory Factor Analysis (EFA)	Ch. 9
March 15, 17	*Spring Break*	
March 22, 24	EFA and Discriminant Analysis (DA)	Ch. 10 (10.1-10.8 and 10.14-10.16)
March 29, 31	DA	
April 5, 7	**Test 3 (April 5),** Logistic Regression (LR)	Ch. 11
April 12, 14	LR	
April 19, 21	LR	
April 26, 28	LR	
May 3, 5	LR, **Test 4 (May 5)**	

B. Policies

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.