Course Syllabus  
Psychology 6813  - Multivariate Statistics for Psychology  
Fall 2010

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Office Hours: 3:15-4:15, W 4:15-5:15

Topics Covered  
- Multiple Regression (brief review)  
- Matrix Algebra  
- Multivariate Analysis of Variance (MANOVA)  
- Path Analysis  
- Discriminant Function Analysis  
- Canonical Correlation  
- Factor Analysis (PCA, EFA, CFA)  
- Generalized Procrustes Analysis  
- Structural Equation Modeling (brief overview)  
- Cluster Analysis

Text  

Additional Reading Material  
Additional reading material (see below) will be assigned throughout the semester. This material will either be placed on reserve in the library or posted on the secure course website:  

http://psychology.okstate.edu/faculty/jgrice/psyc6813/

Objectives  
Learn a wide variety of methods (listed above) for analyzing multiple variables in the context of psychological research. While emphasis will be placed on practical applications of these methods (including reporting results using APA style), theoretical understanding of the techniques will not be sacrificed. In particular, the advantages of employing multivariate statistical methods over bivariate and univariate statistics will be stressed. By the end of this course the student will be able to “think multivariately” and to apply the various techniques to his or her own research and to report results following APA style.

Specifics  
We will work through many of the chapters in Tabachnick and Fidell’s book, and we will cover a number of additional multivariate procedures as well. There will not be any exams in this course; rather, weekly or bi-weekly projects will be assigned. These projects will include, as much as possible, genuine data sets. Your tasks will involve analyzing the data using a multivariate technique, printing and annotating the output from SPSS, LISREL, or Idiogrid, and writing up a brief results section using APA style. Other tasks will involve offering brief answers to conceptual questions, minor hand computations (e.g., with matrix algebra), and analysis of small, contrived data sets.
Grading
Your final grade for this course will be computed as the percentage of total points earned on the projects. 91 to 100 = A; 81 to 90 = B; 71 to 80 = C; 61 to 70 = D; < 61 = F.

Week 1: Review of Bivariate Correlation and Multiple Regression
Chapters 1 and 2: Tabachnick and Fidell (T & F). Skim these review chapters.
Chapter 3: T & F. Read more carefully.

Week 2: Multiple Regression and Geometric Approach to Correlation/Regression
Chapters 4 and 5: T & F

Weeks 3 and 4: Geometric Approach and Matrix Algebra
Appendix A (matrix algebra review): T & F
SPSS syntax manual (out of print). Matrix Commands chapter.

Week 5: Path Analysis (regression with pictures)
Student version of LISREL available at: http://www.ssicentral.com/lisrel/student.html
Testing mediation models: http://davidakenny.net/cm/mediate.htm

Weeks 6, 7 and 8: Multivariate Analysis of Variance (MANOVA)
Chapter 9: T & F

Week 9: Profile Analysis and Discriminant Function Analysis
Chapter 10: T & F
SPSS syntax manual (out of print). Discriminant Function Analysis command chapter.

Week 10: Canonical Correlation
Chapter 6: T & F

Weeks 11, 12, and 13: Factor Analysis (PCA, EFA, CFA)
Chapter 13: T & F
Week 14: Structural Equation Modeling (brief overview)
Chapter 14: T & F.

Week 15: Generalized Procrustes Analysis
Idiogrid Manual (available in software). Section on GPA

Week 16: Cluster Analysis
Idiogrid Manual (available in software). Section on Cluster analysis and Bivariate Statistics
SPSS syntax manual (out of print). Cluster Analysis syntax command chapter.