



NAZARENE UNIVERSITY COLLEGE

BHS 410 *Basic Multivariate Statistics* (3) Fall 2005

Instructor: Kelly Schwartz, Ph.D.

Office Hours: By Appointment

Office: 505

Lab Instructor: Mitch Callan

Class Time: T/Th 2:30-3:45

Phone: 571-2550 Ext. 5908

E-Mail: kschwartz@auc-nuc.ca

Lab Time: M 1:00-2:15

Required Text:

Field, A. (2005). *Discovering statistics using SPSS* (2nd ed.). Thousand Oaks, CA: Sage Publications.

On Reserve:

Girden, E. R. (2001). *Evaluating research articles from start to finish*. Thousand Oaks, CA; Sage.

Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics*. New York: HarperCollins College Publishers.

Course Description:

This course is designed to acquaint the student with both the theory and application of multivariate statistical methods. The focus will be on practical issues such as selecting the appropriate analysis, preparing data for analysis, menu-driven programming, interpreting output, and presenting results. Four overlapping aspects of multivariate procedures will be covered. (1) *Theoretical*: We will examine the heuristic basis of the various statistical techniques and assumptions underlying their use. (2) *Practical*: We will learn to use the SPSS for Windows statistical package to analyze multivariate data. (3) *Interpretive*: We will develop the skills to write accurate and informative results sections based on the techniques used. (4) *Reflective*: We will focus on understanding the history, controversies and limitations in the statistical procedures that we use.

Course Objectives:

At the completion of this course, you should be able to demonstrate:

- How to check data to determine if they are suitable for analysis and, if deemed unsuitable, if and how the data can be made suitable for analysis;
- Skill in deciding what statistical technique(s) will best answer different research questions;
- Ability to input data, run the appropriate statistical technique, and interpret the output, understanding what conclusions can be reached and their limitations; and
- How to critically read peer-reviewed research articles, especially as it pertains to the appropriate use and interpretation of various multivariate analysis techniques.

Course Schedule:	Topic:	Chapter:
September 8	Introduction	
September 13	Revisiting the Statistics You Never Knew Forgot	Ch. 1
September 15	Re-Introduction to SPSS	Ch. 2
September 20	Exploring Data	Ch. 3
September 22, 29	Correlation	Ch. 4
September 27	Community Day (no class)	
October 4, 6	Simple Regression	Ch. 5
October 11, 13	Multiple Regression	Ch. 5
October 18	Logistic Regression	Ch. 6
October 20, 25	<i>t</i> -Test	Ch. 7
October 27	Community Day (no class)	
November 1, 3	Analysis of Variance (ANOVA)	Ch. 8
November 8	Analysis of Covariance (ANCOVA)	Ch. 9
November 10	Reading Days (no class)	
November 15, 17	Factorial ANOVA	Ch. 10
November 22, 24	Repeated Measures Designs	Ch. 11
November 29, December 1, 6	Multivariate Analysis of Variance (MANOVA)	Ch. 14
December 8, 13	Exploratory Factor Analysis	Ch. 15
Exam Period	Final Exam (Take Home)	

Lab Schedule:

September 12	Introduction
September 19	Reintroduction to SPSS
September 26	Exploring Data
October 3	Correlation*
October 10	Thanksgiving Day (No Lab)
October 17	Simple Regression
October 24	Multiple Regression*
October 31	<i>t</i> -Test
November 7	ANOVA*
November 14	Catch Up Lab
November 21	Factorial ANOVA*
November 28	Repeated Measures Designs*
December 5	MANOVA
December 8	Exploratory Factor Analysis*

*Marked assignment

Course Requirements and Grading:

1) **Lab Assignments:** There will be ten (10) lab assignments that are due over the course of the term; only six (6) will be marked (see above). Specifics of each assignment will be provided in each lab class. They will usually involve analyzing a data set, running the appropriate statistical technique, and writing up a results section (APA format). You may work in small groups for these assignments, but each student must hand in his/her own assignment, including the SPSS output. All lab assignments are due to be handed in at the beginning of the following week's lab class. Late assignments will not be accepted. Lab assignments will be worth **40%** of your final grade.

2) **Technique Descriptive Summary and Article Reviews:** For this assignment, you will select one (1) of the major multivariate techniques covered in the course: Correlation, simple regression, multiple regression, t-Test, ANOVA, ANCOVA, factorial ANOVA, MANOVA, repeated measures, logistic regression, or exploratory factor analysis. Find (and copy) two (2) articles from the sociology and psychology literature (one article from each discipline, post-1998) that uses one or more of the technique in their analyses. Ideally, one of the articles should be a "stronger" example of the chosen technique (i.e., correctly executed, well-presented) and one should be a "weaker" example of the chosen technique (i.e., lacks described appropriateness of technique, was performed incorrectly, and/or the write-up is poor).

Using these three articles, prepare a written report that covers:

1) A conceptual summary of the chosen technique (e.g., what it is, when would one use it, what are the requirements for using the technique, how is the analysis performed and interpreted).

2) A description of the advantages and disadvantages of the statistic. These can be statistical (e.g., any assumptions that should be true for the statistic to be applied), interpretational (e.g., interpretation of the results), or practical (e.g., the amount of data required, limitations on the experimental design, etc.). You may also want to describe the advantages of this statistic relative to other statistics that could be used in the same situation.

3) A summary of each article including the study's purpose, methodology, a description of the results, and the conclusions reached based on the use of this statistic. Focus on how the authors analyzed their data and defend your assessment of their work as a strong or weak example of the application.

This written report should be 12-14 pages, double-spaced, 12-point font (NOT including the copies of the articles or references). This assignment is worth **30%** of your final grade and is due at the beginning of the lab on **November 29**.

3) **Final Exam:** There will be a final exam scheduled during the exam period. You will receive Part A of the exam at least one week prior to the exam to be handed in on the day of the exam. This will consist of a data set that you will analyze and write a results section. Part B of the exam will be completed during the exam time and will consist of multiple choice and short answer questions based on the cumulative course material. The exam will be worth **30%** of your final grade.

Course Guidelines:

- 1) Attendance at class is expected from each student. After three (3) unexcused absences (per term), the instructor reserves the right to ask a student to withdraw from the class.
- 2) The written assignments are due on the dates specified. Extensions will only be granted upon request of the student at least two (2) weeks prior to the due date. In the case of illness or other extenuating circumstances, exceptions may be made.
- 3) Exams must be taken at the times specified. The student must inform the instructor immediately if there is a problem with taking a test on a certain date.

Grade Structure:

Percentage:	Letter Grade:	Grade Point Weight:
96-100	A+	4.0
91-95	A	4.0
86-90	A-	3.7
82-85	B+	3.3
75-81	B	3.0
72-74	B-	2.7
68-71	C+	2.3
63-67	C	2.0
60-62	C-	1.7
56-59	D+	1.3
50-55	D	1.0
0-49	F	

Important Notes:

The last day to withdraw from this course and still receive a refund is September 16, 2005.
The last day to withdraw from the class without academic penalty is November 16, 2005.

Relevant Journals (NUC Library):

Applied Developmental Science
Families in Society: The Journal of Contemporary Human Services (InfoTrac)
Journal of Child and Family Studies
Journal of Family Psychology
Reclaiming Children and Youth
Social Development