



**COURSE TITLE/SECTION:** SOCW 8326 (24262) Advanced Multivariate Statistics

**TIME:** Monday 9:00 am – 12 noon

**FACULTY:** Patrick Leung, PhD **OFFICE HOURS:** M 12-1p; Thur 12-1p, 4:15-5:00 p

E-mail: [pleung@uh.edu](mailto:pleung@uh.edu)

Phone: 713-743-8111

FAX: 713-743-8149

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## I. COURSE

### A. CATALOG DESCRIPTION

**Prerequisite:** SOCW 8324 Bio Statistics and doctoral standing in social work. **Emphasizes advanced multivariate statistical procedures, including MANOVA, MANCOVA, discriminant analysis, logistic regression, and meta-analysis.**

### B. PURPOSE

The purpose of this course is to prepare students to analyze data in a wide variety of research settings. This course will focus on advanced statistical procedures, the assumptions underlying various statistical approaches, as well as a framework for choosing the most appropriate statistic in a given data analysis. Advanced multivariate statistics will be highlighted.

## II. OBJECTIVES

Upon completion of this course, students will be able to:

1. Demonstrate an understanding of the relationship between research design and advanced statistical methods in social work research;
2. Demonstrate an understanding of the principles of probability theory in multivariate analysis including Multivariate Analysis of Variance, Multivariate Analysis of Covariance, Discriminant Function Analysis, Logistic Regression, and meta-analysis;
3. Demonstrate the application of the principles of probability theory to statistical problems related to advanced social work research; and
4. Demonstrate the use of the Statistical Package for Social Sciences to analyze data using advanced multivariate statistical procedures.

### III. COURSE CONTENT

This course is the third required statistics courses in the doctoral curriculum. A topical outline is included with the class schedule and reading assignments in a separate attachment to this syllabus.

### IV. COURSE STRUCTURE

The course will be taught using a combination of instructional methods including group and class discussions, lectures, exercises, assigned and recommended readings, and homework assignments. Computer technology for statistical analyses will also be included.

### V. REQUIRED TEXTS/SOFTWARE

Abu-Bader, S. (2010). Advanced and multivariate statistical methods for social work research. Chicago, IL: Lyceum Books, Inc.

Field, A.(2009). Discovering statistics using SPSS (3<sup>rd</sup> ed.). Beverly Hills, CA: Sage Publications.

SPSS, Inc. (2010). SPSS 19.0 for windows brief guide. Chicago, IL: SPSS Inc (or the latest version).

SPSS, Inc. (2010). SPSS for windows graduate pack version, Version 19.0. Chicago, IL: (Author) (or the latest version).

Tabachnick, B.G., & Fidell, L.S. (2007). Using multivariate statistics (5<sup>th</sup> ed.). Boston, MA: Allyn and Bacon.

Wolf, F.M. (1986). Meta-analysis: Quantitative methods for research synthesis. Newbury Park, CA: Sage.

### RECOMMENDED TEXTS

American Psychological Association. (2009). Publication manual of the American Psychological Association (6th ed.). Washington, DC: Author.

Hedderson, J., & Fisher, M. (1993). SPSS made simple (2nd ed.). Belmont, CA: Wadsworth Publishing Company.

Kim, J.O., & Mueller, C.W. (1979). *Factor analysis*. Beverly Hills, CA: Sage.

Kim, J.O., & Mueller, C.W. (1979). *Introduction to factor analysis*. Beverly Hills, CA: Sage.

Kinnear, P.R., & Gray, C.D. (1999). SPSS for windows made simple (3rd ed). East Sussex UK: Psychology Press, Publishers.

Klecka, W.R. (1980). Discriminant analysis. Beverly Hills, CA: Sage.

Knoke, D., & Burke, P.J. (1980). Log-linear models. Beverly Hills, CA: Sage.

Norusis, J Marija (2000). SPSS 10.0: Guide to data analysis. Upper Saddle River, NJ: Prentice Hall.

Osterlind, S., & Tabachnick, B. (2001). SPSS for Windows workbook to accompany using multivariate statistics. (4<sup>th</sup> ed.). Boston, MA: Allyn and Bacon.

## **VI. Course Requirements**

### **A. Reading Assignments**

Please see Topical Outline and Reading Assignments.

### **B. Written Assignments**

To assist students in completing the learning objectives for this course, there will be three graded homework assignments related to the course content.

### **C. Final Exam**

A final exam will be required of all students to demonstrate their knowledge and competency in multivariate statistical analysis.

### **D. Class Participation**

#### **1. Class Attendance (5%)**

One point will be deducted from the final grade for each absence from class. However, a student who is absent from class for more than five times (including both excused and unexcused absence) will be dropped from the course. In the case that the absence is approved by the instructor, half a point will be deducted from the final grade.

#### **2. Class Participation (5%)**

Students are expected to participate in class discussions and projects.

## VII. Evaluation and Grading

Final course grades will be based on the following distribution:

Sept. 26 <sup>th</sup>	Homework Assignment #1 Due	20%
Oct. 17 <sup>th</sup>	Homework Assignment #2 Due	20%
Nov. 14 <sup>th</sup>	Homework Assignment #3 Due	20%
Nov. 28 <sup>th</sup>	Final Exam	30%
	Class Participation	5%
	Class Attendance	5%

### Grades:

A =	96-100% of the points	C+ =	76-79.9%
A- =	92-95.9%	C =	72-75.9%
B+=	88-91.9%	C- =	68-71.9%
B =	84-87.9%	D =	64-67.9%
B- =	80-83.9%	F =	Below 64%

No "incomplete" grades will be given by any instructor without prior permission (excluding an unforeseen emergency) from the instructor.

## VIII. Policy on grades of I (Incomplete):

The grade of "I" (Incomplete) is a conditional and temporary grade given when students are either **(a)** passing a course or **(b)** still have a reasonable chance of passing in the judgment of the instructor but, for non-academic reasons beyond their control have not completed a relatively small part of all requirements.

Students are responsible for informing the instructor immediately of the reasons for not submitting an assignment on time or not taking an examination. Students must contact the instructor of the course in which they receive an "I" grade to make arrangements to complete the course requirements. Students should be instructed not to re-register for the same course in a following semester in order to complete the incomplete requirements.

The grade of "I" must be changed by fulfillment of course requirements within one year of the date awarded or it will be changed automatically to an "F" (or to a "U" [Unsatisfactory] in S/U graded courses). The instructor may require a time period of less than one year to fulfill course requirements and the grade may be changed by the instructor at any time to reflect work complete in the course. The grade of "I" may not be changed to a grade of **W**.

## **IX. Policy on academic dishonesty and plagiarism**

Students are expected to demonstrate and maintain a professional standard of writing in all courses, do one's own work, give credit for the ideas of others, and provide proper citation of source materials. Any student who plagiarizes any part of a paper or assignment or engages in any form of academic dishonesty will receive an "I" for the class with a recommendation that a grade of F be assigned, subsequent to a College hearing, in accordance with the University policy on academic dishonesty. Other actions may also be recommended and/or taken by the College to suspend or expel a student who engages in academic dishonesty.

All papers and written assignments must be fully and properly referenced using APA style format (or as approved by the instructor), with credit given to the authors whose ideas you have used. If you are using direct quotes from a specific author (or authors), you must set the quote in quotation marks or use an indented quotation form. For all direct quotes, you must include the page number(s) in your text or references. Any time that you use more than four or five consecutive words taken from another author, you must clearly indicate that this is a direct quotation. Please consult the current APA manual for further information.

Academic dishonesty includes using any other person's work and representing it as your own. This includes (but is not limited to) using graded papers from students who have previously taken this course as the basis for your work. It also includes, but is not limited to submitting the same paper to more than one class. If you have any specific questions about plagiarism or academic dishonesty, please raise these questions in class or make an appointment to see instructor. This statement is consistent with the University Policy on Academic Dishonesty that can be found in your UH Student Handbook.

## **X. Consultation**

Individual appointments will be scheduled with any member of the class upon request. The instructor can be reached by calling (713) 743-8111 or contacting him in his office during office hours (Work Building Room 413), or by e-mail at PLEUNG@UH.EDU or by fax at (713) 743-8149.

**Addendum:** Whenever possible, and in accordance with 504/ADA guidelines, the University of Houston will attempt to provide reasonable academic accommodations to students who request and require them. Please call 713-743-5400 for more assistance.

## TOPICAL OUTLINE AND READING ASSIGNMENTS

<u>Class Session</u>	<u>Lecture Topic and Readings</u>
August 22 <sup>nd</sup>	Introduction Review of Course Syllabus Review of the Framework for Statistical Analysis Review of MANOVA and MANCOVA  Abu-Bader Ch. 9 Field, Ch.16
August 29 <sup>th</sup> to September 12 <sup>th</sup>	Discriminant Function Analysis  General Purpose & Description Kinds of Research Questions Limitations Fundamental Equations Types of Discriminant Function Important Issues  Grimm & Yarnold, Ch. 9 Tabachnick & Fidell, Ch. 11 Field, pp. 615-625
September 19 <sup>th</sup> to October 3 <sup>rd</sup>	Meta-analysis  Meta-analysis & Synthesizing Research Combined Tests Measures of Effect Size Examining and Reducing Bias Nonparametric Methods Limitations and Strengths Grimm & Yarnold, Ch. 10 Wolf Chs. 1-6
October 10 <sup>th</sup>	Structural Equation Modeling
October 17 <sup>th</sup> to October 31 <sup>st</sup>	Logistic Regression  General Purpose & Description Kinds of Research Questions Limitations Types of Logistic Regression Important Issues

	Grimm & Yarnold, Ch. 7 Field, Ch 8 Morrow-Howell, N., & Proctor, E.K. (1992). The use of logistic regression in social work research (to be distributed in class). Osterlind & Tabachnick, Ch 12
November 7 <sup>th</sup>	Logistic Regression Fundamental Equations Types of Logistic Regression Important Issues  Abu-Bader Ch. 5
November 14 <sup>th</sup> to November 21 <sup>st</sup>	Introduction to Factor Analysis  Kinds of Research Questions Fundamental Concepts of Factor Analysis Obtaining Factor Analysis Solutions Some Important Issues Tabachnick & Fidell, Ch 13 Osterlind & Tabachnick, Ch 13 Grimm & Arnold, Ch 4 Field, Ch 17  Course Review and Evaluation
November 28 <sup>th</sup>	Final Exam