UNIVERSITY of HOUSTON

GRADUATE COLLEGE OF SOCIAL WORK WWW.SW.UH.EDU

COURSE TITLE/SECTION: SOCW 8325/17819 Applied Multivariate Statistics

TIME: Tuesday 1:00pm-4:00pm Room SW231

FACULTY: Patrick Leung PhD **OFFICE HOURS**: T & W 12-1 & 4:00-5:00pm

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I. Course

A. Catalog Description

Prerequisite: SOCW 8324 Bio Statistics and doctoral standing in social work. Emphasizes the use of the Statistics Package for Social Sciences (SPSS) in applied social work research.

B. Purpose

The purpose of this course is to prepare students to use SPSS to analyze data in a wide variety of applied research settings. This course will focus on advanced statistical procedures in association with procedures in SPSS. Multiple Regression, Analysis of Variance and Analysis of Covariance will be highlighted in the SPSS Program.

II. Course Objectives

Upon completion of this course, students will be able to demonstrate the following objectives:

1. Demonstrate an understanding of the relationship between research design and the use of SPSS in applied social work research;
2. Demonstrate the use of the Statistical Package for Social Sciences to analyze multivariate statistical data in applied social work research;
3. Demonstrate an understanding of the principles of probability theory in basic multivariate statistical analyses including Multiple Regression, Analysis of Variance, Analysis of Covariance in association with the SPSS Program; and
4. Demonstrate an understanding of the programming and commands in the SPSS Program.

III. Course Content

This course is the second of three 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 Text/Software

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

Field, A.(2013). Discovering statistics using SPSS (4th ed.). Beverly Hills, CA: Sage Publications.

Norusis, M. (1997). SPSS 7.5 guide to data analysis. Upper Saddle River, New Jersey: Prentice Hall, chapters 19-23.

SPSS, Inc. (2013). SPSS for windows graduate pack version, Version 22.0. Chicago, IL: (Author) (or the latest version).

Recommended Texts

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

Allison, Paul D. (1999). Multiple regression: A primer. Thousand Oaks, CA: Pine Forge Press.

Beck-Lewis, Michael S. (1980). Applied regression: An introduction. Beverly Hills, CA: Sage Publications.

Berry, William D. & Feldman, Stanley (1985). Multiple regression in practice. Beverly Hills, CA: Sage Publications.

Bray, James H. & Maxwell, Scott E. (1985). Multivariate analysis of variance. Beverly Hills, CA: Sage Publications.

Green, S, & Salkind, N. (2011). Using SPSS for Windows and Macintosh: Analyzing and understanding data (6th ed.). Upper Saddle River, NJ: Prentice-Hall, Inc.

Grimm, L., & Yarnold, P. (Eds.). (1995). Reading and understanding multivariate statistics. Washington, D.C.: American Psychological Association.

Iversen, Gudmund R. & Norpoth, Helmut (1976). Analysis of variance. Beverly Hills, CA: Sage Publications.

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

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

Wildt, Albert R. & Ahtola, Olli T. (1978). Analysis of covariance. Beverly Hills, CA: Sage Publications.

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. Only hard copies of the assignments will be accepted.

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 taken 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 non-excused 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

The Following course grades will be based on the following distribution:

Feb. 24	Homework Assignment #1 Due	20%
March 24	Homework Assignment #2 Due	20%
April 14	Homework Assignment #3 Due	20%
April 28	Final Exam	30%
	Class Participation	5%
	Class Attendance	5%

The following standard grading scale has been adopted for all courses taught in the college.

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 completed 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 412), or by e-mail at pleung@uh.edu or by fax at (713) 743-8149.

XI. Americans with Disabilities Statement

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. Instructors may not provide accommodations without supporting documentation from the UH Center for Students with Disabilities.

TOPICAL OUTLINE AND READING ASSIGNMENTS

Class Session	**Lecture Topic and Readings**
January 20	Introduction Review of Course Syllabus A Framework for Statistical Analysis Review of Univariate and Bivariate Statistics Abu-Bader Chs. 1 & 2 Field Chs. 1, 2, 3, 4, 6, 7 and 9
January 27	Review of Simple Linear Regression Abu-Bader Ch. 3
February 3	Issues in Statistical Assumptions Field Ch. 5
February 10 to February 17	Multiple Regression Analysis I The Regression Assumptions Confidence Intervals and significance test The Prediction Error for Y Analysis of Residuals Abu-Bader Ch. 4 Field, Ch. 8
February 24	**Homework Assignment #1 Due**
February 24	Multiple Regression Analysis II The General Equation Interpreting the Parameter Estimates The Multiple R-square Predicting Y The Possibility of Interaction Effects Dummy Variables Norusis, Chs. 19-23 (to be placed outside my office door)
March 3	Multiple Regression Analysis III Specification Error Measurement Error Multicollinearity & Nonlinearity Moderation & Mediation Field, Ch. 10

March 10	One-Way ANOVA Two-Way ANOVA Abu-Bader Chs. 1 and 6 Field, Chs. 11 (ANOVA) & 13 (Factorial ANOVA)
March 17	Spring Break (No Class)
March 24	**Homework Assignment #2 Due**
March 24 to March 31	Two-Way ANOVA Two-way Analysis of Covariance Abu-Bader Chs. 7 Field, Chs.14 (ANCOVA)
April 14	**Homework Assignment #3 Due**
April 7 to to April 21	MANOVA & MANCOVA Abu-Bader Ch. 9 Field, Ch.16
April 28	**Final Exam**

BIBLIOGRAPHY

Statistical Methods: Basic

Balakrishnan, N. (2012). *Methods and applications of statistics in the social and behavioral sciences*. Hoboken, N.J: Wiley.

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Elliott, A. C., & Woodward, W. A. (2007). *Statistical analysis quick reference guidebook: With SPSS examples*. Thousand Oaks, Calif: Sage Publications. *(HA29 .E4826 2007)

Foster, J. J., Barkus, E., & Yavorsky, C. (2006). *Understanding and using advanced statistics*. London: SAGE Publications. *(HA29 .F583 2006)

Frankfort-Nachmias, C. & Leon-Guerrero, A. (2006). Social Statistics for a diverse society (4th ed.). Thousand Oaks: Pine Forge Press

Gaur, A. S., & Gaur, S. S. (2006). *Statistical methods for practice and research: A guide to data analysis using SPSS*. New Delhi: Response Books. *(HA32 .G38 2006)

Guilford, J.P., & Fruchter, B. (1978). Fundamental statistics in psychology and education (6th ed.). New York: McGraw-Hill.

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Hancock, G. R., & Mueller, R. O. (2010). *The reviewer's guide to quantitative methods in the social sciences*. New York: Routledge. *(H62 .R466 2010)

Hopkins, D.K., Hopkins, B.R., & Glass, G.V. (1996). Basic statistics for the behavioral sciences. Boston : Allyn and Bacon. *(HA29 .H734 1996)

Huizingh, E. (2007). *Applied statistics with SPSS*. London: SAGE. *(QA276.4 .H82 2007)

Kuehl, R.O. (2000). Design of experiments : statistical principles of research design and analysis. Pacific Grove, CA : Duxbury/Thomson Learning. *(Q182.3 .K84 2000)

Larsen, R.J., & Marx, M.L. (1981). An introduction to mathematical statistics and its applications. Englewood Cliffs, NJ: Prentice-Hall. *(QA276.L314)

McPherson, G. (2001). Applying and interpreting statistics: a comprehensive guide. New York: Springer. *(Q180.55.S7 M36 2001)

MacEachron, A.E. (1982). Basic statistics in the human services: An applied approach. Baltimore: University Park Press. *(HA29 .M174 1982)

Newman, I. & Newman, C. (2006). Conceptual Statistics for Beginners. Lanham, MD: University Press of America. *(QA276.12.N47 2006)

Newton, R. R., & Rudestam, K. E. (2013). *Your statistical consultant: Answers to your data analysis questions*. Thousand Oaks: SAGE Publications. *(HA29 .N458 2013)

Ohrnstedt, G.W.B., & Knoke, D. (1982). Statistics for social data analysis. Itasca, IL: Peacock.

Petscher, Y. M., Schatschneider, C., Compton, D. L., & Petscher, Y. M. (2013). *Applied quantitative analysis in education and the social sciences*. *(QA278.2 .A67 2013)

Singh, K. (2007). *Quantitative social research methods*. Los Angeles: Sage Publications. *(H62 .S47757 2007)

Vogt, W. P. (2005). *Dictionary of statistics & methodology: A nontechnical guide for the social sciences*. Thousand Oaks, Calif: Sage Publications. *(HA17 .V64 2005)

Weinberg, S. L., & Abramowitz, S. K. (2008). *Statistics using SPSS: An integrative approach*. Cambridge: Cambridge University Press. *(QA276 .W4423 2008)

Zeller, R.A., & Carmines, E.G. (1978). Statistical analysis of social data. Chicago: Rand McNally.

Multivariate Analysis: General

Atkinson, A. C., Riane, M., & Ceriole, A. (2004). Exploring multivariate data with the forward search. New York: Springer-Verlag . *(QA278.A85 2004) *(QA278.75.A38 2005)

Baxter, M.J. (1994). Exploratory multivariate analysis in archaeology. Edinburgh: Edinburgh University Press. *(CC80.6.B39 1994)

Bernstein, I.H., Garbin, C.P., & Teng, G.K. (1988). Applied multivariate analysis. New York: Springer-Verlag. *(QA278.B457 1988)

Berry, W.D., & Feldman, S. (1985). Multiple regression in practice. Beverly Hills, CA: Sage.

Bray, J.H., & Maxwell, S.E. (1985). Multivariate analysis of variance. Beverly Hills, CA: Sage.

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Factor Analysis

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