UNIVERSITY *of* HOUSTON

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

COURSE TITLE/SECTION: SOCW 8326 (19485) Advanced Multivariate Statistics

TIME: **Monday** 9:00 a.m. – 12 noon

FACULTY: Patrick Leung, PhD   **OFFICE HOURS**: M 12-1p; Tue 4:00-6:00 p

E-mail: pleung@uh.edu   Phone: 713-743-8111   FAX: 713-743-8149

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 (3rd ed.). Beverly Hills, CA: Sage Publications.

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

SPSS, Inc. (2011). SPSS 20.0 for windows brief guide. Chicago, IL: SPSS Inc (or the latest version).

SPSS, Inc. (2010). SPSS for windows graduate pack version, Version 20.0. Chicago, IL: (Author) (or the latest version).

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). <u>SPSS for windows made simple</u> (3rd ed). East Sussex UK: Psychology Press, Publishers.

Klecka, W.R. (1980). <u>Discriminant analysis</u>. Beverly Hills, CA: Sage.

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

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

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

Tabachnick, B.G., & Fidell, L.S. (2007). <u>Using multivariate statistics</u> (5th 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. 23rd	Homework Assignment #1 Due	20%
Oct. 14th	Homework Assignment #2 Due	20%
Nov. 11th	Homework Assignment #3 Due	20%
Dec. 2nd	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 <u>must</u> set the quote in quotation marks <u>or</u> 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 <u>clearly </u>indicate that this is a direct quotation. Please consult the current APA manual for further information.

Academic dishonesty includes using <u>any</u> 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.

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

Class Session	Lecture Topic and Readings

August 26th   Introduction
  Review of Course Syllabus
  Review of the Framework for Statistical Analysis
  Introduction to Discriminant Function Analysis

September 2   Labor Day (No Class)

September 9th   Discriminant Function Analysis
  General Purpose & Description
  Kinds of Research Questions
  Limitations
  Fundamental Equations
  Types of Discriminant Function
  Important Issues
 Grimm & Yarnold, Ch. 9
 Field, pp. 615-625

September 16th to September 30th   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 7th to October 14th   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).

October 21st to   Logistic Regression
October 28th   Fundamental Equations
                                 Types of Logistic Regression
                                 Important Issues
                         Abu-Bader Ch. 5

November 4th to   Factor Analysis
November 25th

                                 Kinds of Research Questions
                                 Fundamental Concepts of Factor Analysis
                                 Obtaining Factor Analysis Solutions
                                 Some Important Issues
                         Grimm & Arnold, Ch 4
                         Field, Ch 17

                         Course Review and Evaluation

December 2rd   Final Exam (in class)

BIBLIOGRAPHY

Statistical Methods: Basic

Balock, H.M., Jr., (1972). *Social statistics* (2nd ed.). New York: McGraw-Hill.*(HA29 .B59 1972)

Elifson, K.W., Runyon, R.P., & Haber, A. (1982). *Fundamentals of social statistics*. Reading, MA: Addison-Wesley.

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

Healey, J.F. (1984). *Statistics: A tool for social research*. Belmont, CA: Wadsworth.

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

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)

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

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

Multivariate Analysis: General

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.

Bryman, A., & Cramer, D. (1990). *Quantitative data analysis for social sciences*. London: Routledge.

Busch, D.H. (1991). *The new critical path method: CPM: The state-of-the-art in project modeling and time reserve management*. Chicago: Probus Publishing Company. *(TS158.B87 1991)

Bryne, B.M. (1989). *A primer of LISREL: Basic applications and programming for confirmatory factor analytic models*. New York: Springer-Verlag. *(HA32 .B97 1989)

Carroll, J.D., & Green, P.E. (1997). *Mathematical tools for applied multivariate analysis*. San Diego: Academic Press. *(QA278 .C37 1997)

Child, D. (1990). *The essentials of factor analysis* (2en ed.). London: Cassell.

Christensen, R. (1990). *Log-linear models*. New York: Springer-Verlag. *(QA278.C49 1990)

Cooley, W.W., & Lohnes, R.R. (1971). *Multivariate data analysis*. New York: Wiley. *(QA278.C65)

Crowder, M.J., & Hand, D.J. (1990). *Analysis of repeated measures* (1st ed.). London: Chapman and Hall.

Dunn, O.J., & Clark, V.A. (1987). *Applied statistics: Analysis of variance and regression* (2nd ed.). New York: Wiley. *(QA279.D87 1987)

Dwyer, J.H. (1983). *Statistical models for the social and behavioral sciences*. New York: Oxford University Press. *(H61.25 .D85 1983)

Edwards, A.L. (1985). *Multiple regression and the analysis of variance and covariance* (2nd ed.). New York: W.H. Freeman. *(BF39.E32 1985)

Everitt, B.S., & Dunn, G. (2001). *Applied multivariate data analysis.* London : Arnold ; New York : Oxford University Press. *(QA278 .E88 2001)

Fang, K., & Zhang, Y. (1990). *Generalized multivariate analysis*. Beijing: Science Press. *(QA278.F35 1990)

Farrell, R.H. (1985). *Multivariate calculation: Use of the continuous groups*. New York: Springer-Verlag.

Flury, B., & Riedwyl, H. (1988). *Multivariate statistics: A practical approach*. London: Chapman and Hall. (Available at the UH Downtown: QA278.F58813 1988)

Grimm, L.G.,& Yarnold, P.R. (Ed.). (2000). *Reading and understanding more multivariate statistics*. Washington, DC : American Psychological Association. *(QA278 .R32 2000)

Geer, J.P. van de. (1993). *Multivariate analysis of categorical data.* Newbury Park, CA : Sage. (Available at the UH Downtown: QA278.G433 1993 v. 2)

Girden, E.R. (1992). *ANOVA: Repeated measures.* Newbury Park, CA: Sage. *(HA29 .G567 1992)

Goodman, L.A., & Magidson, J. (Ed.). (1985). *Analyzing qualitative/categorical data: Log-linear models and latent structure analysis.* Lanham, MD: University Press of America. *(QA278.2.G63 1978B)

Green, P.E. (1978). *Mathematical tools for applied multivariate analysis*. New York: Academic Press. (Available at the UH Downtown: QA278.G73 1978)

Gupta, A.K. (Ed.). (1987). *Advances in multivariate statistical analysis*. Boston: Kluwer Academic Publishers. *(QA278.A28 1987)

 Harris, R.J. (2001). *A primer of multivariate statistics*. Mahwah, N.J.: Lawrence Erlbaum Associates. *(QA278 .H35 2001)

Hagenaars, J.A. (1990). *Categorical longitudinal data: Log-linear panel, trend, and cohort analysis*. Newbury Park: CA: Sage. *(QA278.H33 1990)

Hair, J.F., Anderson, R.E., & Tatham, R.L (1987). Multivariate data analysis with readings (2nd ed.). New York: Macmillan.

Hand, D.J., & Taylor, C.C. (1987). *Multivariate analysis of variance and repeated measures: A practical approach to behavioral scientists*. London: Chapman and Hall. *(QA278.H345 1987)

Hanushek, E.A., & Jackson, J.E. (1977). *Statistical methods for social scientists*. New York: Academic Press.

Hayduk, L.A. (1987). *Structural equation modeling with LISREL: Essentials and advances*. Baltimore: Johns Hopkins University Press. *(QA278.3 .H39 1987)

Hays, W.L. (1973). *Statistics for the social sciences* (2nd ed.). New York: Holt, Rinehart, and Winston.

Howard, E.A., & Steven D. B. (Ed.). (2000). *Handbook of applied multivariate statistics and mathematical modeling.* San Diego : Academic Press. *(QA278 .H3453 2000)

James. S. (2001). *Applied multivariate statistics for the social sciences.* Mahwah, N.J.: Lawrence Erlbaum Associates. *(QA278 .S74 2001)

Johnson, R.A., & Wichern, D.W. (1982). *Applied multivariate statistical analysis.* Englewood Cliffs, NJ: Prentice-Hall.

Johnson, R.A., & Wichern, D.W. (1988). *Applied multivariate statistical analysis*. (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.

Johnsson, T. (1989). *On stepwise procedures for some multiple inference problems*. Gteborg: Alqvist & Wiksell International.

Kachigan, S.K. (1982). *Multivariate statistical analysis.* New York: Radius Press.

Kachigan, S.K. (1986). *Statistical analysis: An interdisciplinary introduction to univariate & multivariate methods*. New York: Radius Press.

Kariya, T. (1985). *Testing in the multivariate general linear model*. Tokyo: Kinokuniya Co.

Keppel, G., & Zedeck, S. (1989). *Data analysis for research designs: Analysis-of-variance and multiple regression/correlation approaches*. New York: W.H. Freeman. *(Library of Optomtry: HA29 .K435 1989)

Krippendorff, K. (1986). *Information theory: Structural models for qualitative data*. Beverly Hills, CA: Sage.

Krzanowski, W.J. (2000). *Principles of multivariate analysis : A user's perspective*. Oxford [Oxfordshire] ; New York : Oxford University Press. *(QA278 .K73 2000)

Khattree, R., & Naik, D. N. (1999). *Applied multivariate statistics with SAS software.* Cary, NC : SAS Institute ; [New York] : J. Wiley & Sons. (Available at the UH Downtown: QA278 .K43 1999)

Levine, G. (1991). *A guide to SPSS for analysis of variance*. Hillsdale, NJ: Lawrence Erlbaum Associates. *(HA31.35 .L48 1991)

Lindzey, G., & Aronson, E. (Eds.). (1968). *The handbook of social psychology* (end ed.) (Vol. 2 Research Methods). Reading, MA: Addison-Wesley. *(HM251 .L485 1968 v. 1)

Manly, B.F.J. (1986). *Multivariate statistical methods: A primer*. London: Chapman and Hall. *(QA278.M35 1986)

McDonald, R.P. (1985). *Factor analysis and related methods*. Hillsdale, NJ: Lawrence Erlbaum Associates. (Available at the UH Downtown: HA29 .M4385 1985)

Morrison, D.F. (1990). *Multivariate statistical methods* (2nd e3d.). New York: McGraw-Hill. *(QA278.M68 1990)

Næs, T., & Risvik, E. (Ed.). (1996). *Multivariate analysis of data in sensory science.* Amsterdam ; New York : Elsevier. * (QP435 .M83 1996)

Narayan C. G. (1996). *Multivariate statistical analysis*. New York : M. Dekker. *(QA278 .G557 1996)

Neter, J., Wasserman, W., & Kutner, M.H. (1990). *Applied linear statistical models: Regression, analysis of variance, and experimental designs* (3rd ed.). Homewood, IL: Irwin.

Nikiforov, A.F., Suslov, S.K., & Uvarov, V.B. (1991). *Classical orthogonal polynomials of a discrete variable.* Berlin: Springer-Verlag.

Norris, C.N., & Rolph, J.E. (1981). *Introduction to data analysis and statistical inference*. Englewood Cliffs, NJ: Prentice-Hall.

Parsa, A.R. (1990). *Analysis of contingency tables with structural zeros and ordered categories*. Unpublished doctoral dissertation, Texas A & M University, College Station, TX.

Read, T.R.C., & Cressie, N.A.C. (1988). *Goodness-of-fit statistics for discrete multivariate data*. New York: Springer-Verlag.

Richard, A.J., & Dean, W.W. (2002). *Applied multivariate statistical analysis.* Upper Saddle River, N.J.: Prentice Hall. *(QA278 .J63 2002)

Richard, A. R., & Enrico, S. (1999). *Aspects of multivariate statistical analysis in geology*. Amsterdam ; New York : Elsevier. *(QE33.2.S82 R49 1999)

Santner, T.J., & Duffy, D.E. (1989). *The statistical analysis of discrete data*. New York: Springer-Verlag.

Stevens, J. (2002). *Applied multivariate statistics for the social sciences*. Hillsdale, NJ: L. Erlbaum Associates. *(QA278 .S74 2001)

Stone, M. (1987). Coordinate-*free multivariate statistics: An illustrated geometric progression from Halmos to Gauss and Bayes*. Oxford: Clarendon Press.

Tandy, R.D. (1989). *An empirical comparison of univariate and multivariate repeated measures analysis techniques when applied to motor performance data microform: A Monte Carlo study*. Unpublished doctoral dissertation, Texas A & M University, College Station, TX.

Tabachnick, B.G., & Fidell, L.S. (2001). *Using multivariate statistics*. Boston : Allyn and Bacon. (Available at the UH Clear Lake: QA278 .T3 2001)

Tatsuoka, M. (1971). *Multivariate analysis*. New York: Wiley.

Tong, Y.L. (1990). *The multivariate normal distribution*. New York: Springer-Verlag.

Thomas T.H. W. (2002). *Evidence-based health care management : Multivariate modeling approaches*. Boston : Kluwer Academic Publishers. *(RA427.9 .W36 2002)

Wickens, T.D. (1995). *The geometry of multivariate statistics.* Hillsdale, N.J.: L. Erlbaum Associates. (Available at the UH Downtown: QA278 .W53 1995)

Zeller, R.A., & Carmines, E.G. (1980). *Measurement in the social sciences: The link between theory and data*. New York: Cambridge University Press. *(H61 .Z433)

Multiple Correlation/Regression

Archdeacon, T. J. (1994). *Correlation and regression analysis: A historian's guide.* Madison, Wis. : University of Wisconsin Press. (Available in UH Law Library /Stacks: D16.17.A73 1993)

Allen, M.P. (1997). *Understanding regression analysis*. New York : Plenum Press. *(QA278.2 .A434 1997)

Allison, P. D. (1999). *Multiple regression : A primer.* Thousand Oaks, California: Pine Forge Press. (Available at the UH Downtown: QA278.2 .A435 1999)

Aiken, L.S., & West, S.G. (1991). *Multiple regression : Testing and interpreting interactions.* Newbury Park, California: Sage Publications. (Available at the UH Downtown: QA278.2.A34 1991)

Achen, C.H. (1982). *Interpreting and using regression*. Beverly Hills, CA: Sage. *(HA31.3 .A33 1982)

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

Cohen, J., & Cohen, P. (1975). *Applied multiple regression/correlation for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Chatterjee, S., Hadi, A. S., & Price, B. (2000). *Regression analysis by example*. New York : Wiley. *(QA278.2 .C5 2000)

Draper, N. R., & Smith, H. (1998). *Applied regression analysis*. New York: Wiley. *(QA278.2 .D7 1998)

Foster, D. P., Stine, R.A., & Waterman, R.P. (1998). *Business analysis using regression : A casebook*. New York : Springer. *(HA31.3 .F67 1998)

Freund, R.J., & Wilson, W. J. (1998). *Regression analysis : statistical modeling of a response variable*. San Diego : Academic Press. *(QA278.2 .F698 1998)

Fox, John (1991). *Regression diagnostics*. Beverly Hills, CA: Sage.

Kahane, L.H. (2001). *Regression basics.* Thousand Oaks, California: Sage Publications. *(QA278.2 .K34 2001)

Kleinbaum, D.G. (Ed.). (1998). *Applied regression analysis and other multivariable methods.* Pacific Grove: Duxbury Press. *(QA278 .A665 1998)

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

Loader, C. (1999). *Local regression and likelihood.* New York : Springer. *(QA276.8 .L6 1999)

Marsden, P.V. (1981). *Linear models in social research*. Beverly Hills, CA: Sage.

Menard, S.W. (2002). *Applied logistic regression analysis*. Thousand Oaks, California: Sage Publications. *(QA278.2 .M46 2002)

Montgomery, D.C. (2001)*. Introduction to linear regression analysis*. New York : Wiley. *(QA278.2 .M65 2001)

Morrison, D.F. (1983). *Applied linear statistical methods*. Englewood Cliffs, NJ: Prentice-Hall. *(QA278.M677 1983)

Natraj, A.K. (1993). *Achieving successful outcomes in construction projects using regression methods*. *(Thesis Collection: Thesis 650 1993.N37)

Pedhazur, E.J. (1982). *Multiple regression in behavioral research: Explanation and prediction* (2nd ed.). New York: Holt, Rinehart, & Winston. *(HA31.3 .P4 1982)

Rawlings, J.O., Pantula, S.G., & Dickey, D.A. (1998). *Applied regression analysis : A research tool.* New York: Springer. *(QA278.2 .R38 1998)

Factor Analysis

Bartholomew, D.J., & Knott, M. (1999). *Latent variable models and factor analysis*. London: Arnold. *(QA278.6 .B37 1999)

Child, D. (1970). *The essentials of factor analysis*. New York: Holt, Rinehart, & Winston.

Glen, W. G., Dunn, W.J., & Scott, D.R. (1992). *Principal components analysis and partial least squares regression* [microform]. Washington, D.C.: U.S. Environmental Protection Agency. (Available at the UH Clear Lake: US Doc Microfiche Section: EP 1.23/6:600/J-92/135)

Hatcher, L. (1994). *A step-by-step approach to using the SAS system for factor analysis and structural equation modeling*. Cary, N.C.: SAS Institute. (Available at the UH Downtown: QA278.5.H38 1994)

Harmon, H.H. (1967). *Modern factor analysis* (rev. ed.). Chicago: University of Chicago Press. *(QA276.H38 1967)

Jaccard, J. (1998). *Interaction effects in factorial analysis of variance*. Thousand Oaks: Sage Publications. *(HA29 .J227 1998)

Jackson, D.J., & Borgatta, E.F. (1981). *Factor analysis and measurement in social research*. Beverly Hills, CA: Sage.

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.

Loehlin, J.C. (1998). *Latent variable model: An introduction to factor, path, and structural analysis*. Mahwah, N.J.: Lawrence Erlbaum. *(QA278.6 .L64 1998)

Merkle, L.A. (1997). *Factor analysis of the self-motivation inventory*. *(Thesis 370 1997.M47)

Reyment, R.A., & Jöreskog, K.G. (1996). *Applied factor analysis in the natural sciences*. Cambridge [England] ; New York, NY, USA : Cambridge University Press. *(QA278.5 .R49 1996)

Rummel, R.J. (1970). *Applied factor analysis*. Evanston, IL: Northwestern University Press. *(HA33 .R85)

Discriminant Function Analysis

Klecka, W.R. (1980). *Discriminant analysis*. Beverly Hills, California: Sage Publications. *(HA31.4 .K56)

Mirkin, B. (1996). *Mathematical classification and clustering*. Dordrecht ; Boston : Kluwer Academic Pubishers. *(QA278.65 .M57 1996)

Morton, T.G. (1974). *A discriminant function analysis of residential mortgage delinquency and foreclosure*. Storrs : Center for Real Estate and Urban Economic Studies, University of Connecticut. *(HD251 .R283 v.14)

McLachlan, G. J. (1992). *Discriminant analysis and statistical pattern recognition*. New York : Wiley. *(QA278.65.M38 1992)

Meta-analysis

Bukoski, W. J. (Ed.). (1997). *Meta-analysis of drug abuse prevention programs*. Rockville, MD (5600 Fishers Lane, Rockville 20857) : U.S. Dept. of Health and Human Services, National Institutes of Health, National Institute on Drug Abuse, Division of

Epidemiology and Prevention Research : [Supt. of Docs., U.S. G.P.O., distributor]. *(US Document: HE 20.3965:170)

Cook, T. (1992). *Meta-analysis for explanation : A casebook.* New York : Russell Sage Foundation. (Available at the UH Clear Lake: H62 .M4246 1992)

Eddy, D. M., Hasselblad, V., & Shachter, R. (1992). *Meta-analysis by the confidence profile method : The statistical synthesis of evidence.* Boston : Academic Press. *(R853.S7E34 1991)

Hedges, L.V., & Olkin, I. (1985). *Statistical methods for meta-analysis.* Orlando : Academic Press. *(HA29 .H425 1985)

Stangl, D. K., & Berry, D. A. (Ed.). (2000). *Meta-analysis in medicine and health policy.* New York ; Basel : Marcel Dekker. (Available at Pharmacy Library: General Collection: RA440.6 .M48 2000)

Logistic Regression

Jaccard, J. (2001). *Interaction effects in logistic regression.* Thousand Oaks, California: Sage Publications. *(HA31.3 .J328 2001)

Kleinbaum, D.G. (1994). *Logistic regression : A self-learning text.* New York: Springer. (Available at the UH Clear Lake: R853.S7 K54 1994)

Menard, S. (2000). Applied *logistic regression analysis.* Thousand Oaks, California: Sage Publications. *(QA278.2 .M46 2002)

Pampel, F.C. (2000). *Logistic regression: A primer.* Thousand Oaks, California: Sage Publications. *(HA31.3 .P36 2000)

Vach, W. (1994). *Logistic regression with missing values in the covariates.* New York: Springer-Verlag. *(QA278.2.V25 1994)

Loglinear

Christensen, R. (1990). *Log-linear models***.** New York: Springer-Verlag. *(QA278.C49 1990)

Christensen, R. (1997). *Log-linear models and logistic regression***.** New York: Springer. *(QA278 .C49 1997)

Hagenaars, J. A. (1993). *Loglinear models* with latent variables. Newbury Park, California; London: Sage Publications. *(QA278.H333 1993)

Hanson, B.A., & Feinstein, Z. S. (1997). *Application of a polynomial loglinear model to assessing differential item functioning for common items in the common-item equating design.* Iowa City, Iowa: ACT, Inc. *(LB3051 .A5286 v. 97-1)

Ishii-Kuntz, M. (1994). *Ordinal log-linear models.* Thousand Oaks, California: Sage Publications. *(QA278.I74 1994)

Structural Equation Modeling

Cudeck, R., du Toit, S., & Sörbom, E. (Ed.). (2001). *Structural equation modeling, present and future : a festschrift in honor of Karl Jöreskog.* Lincolnwood, IL: Scientific Software International. *(QA278 .S76 2001)

Hoyle, R.H. (Ed.). (1995). *Structural equation modeling : Concepts, issues, and applications*. Thousand Oaks: Sage Publications. *(H61.25 .S767 1995)

Kaplan, D. (2000). *Structural equation modeling : Foundations and extensions*. Thousand Oaks, California: Sage Publications. *(H61.25 .K365 2000)

Kline, R.B. (1998). *Principles and practice of structural equation modeling*. New York: Guilford Press. *(QA278 .K585 1998)

Path Analysis

Loehlin, J.C. (1998). *Latent variable models: an introduction to factor, path, and structural analysis*. Mahwah, N.J.: Lawrence Erlbaum. *(QA278.6 .L64 1998)

Canonical Correlation Analysis

Gittins, R. (1985). *Canonical analysis: a review with applications in ecology*. Berlin ; New York : Springer-Verlag. *(QH541.15.S72G58 1985)

McKeon, J. J. (1967). *Canonical analysis: some relations between canonical correlation, factor analysis, discriminant function analysis, and scaling theory*. Princeton, N.J., Psychometric Society. (Available at the UH Clear Lake: BF39 .M18)

Pourahmadi, M., & Miamee, A.G. (1989). *Computation of canonical correlation and best predictable aspect of future for time series [microform]*. Washington, DC : National Aeronautics and Space Administration. *(Current Journal: NAS 1.26:184655 MICROFICHE)

* Available at the University of Houston, M.D. Anderson Library.