

University of Manitoba
Department of Sociology
Winter 2013 (3 credit hours)

SOC 7400 ADVANCED QUANTITATIVE RESEARCH METHODS

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Timeslot: Friday 11:30am-2:30pm Room: 335 Isbister
Office Hours: By appointment

Required Text:

Meyers, L.S., Gamst, G., & Guarino, A.J. (2013). *Applied Multivariate Research: Design and Interpretation* (2nd ed.). Thousand Oaks, CA: Sage.

Recommended Texts:

Collier, J. (2010). *Using SPSS Syntax: A Beginner's Guide*. Thousand Oaks, CA: Sage.

George, D. & Mallery, P. (2011). *IBM SPSS Statistics 19 Step by Step: A Simple Guide and Reference* (12th ed.). New York: Pearson.

Tabachnick, B.G., & Fidell, L.S. (2012). *Using Multivariate Statistics* (6th ed.). Boston: Allyn and Bacon.

Vogt, W.P., & Johnson, B. (2011). *Dictionary of Statistics and Methodology: A Nontechnical Guide for the Social Sciences* (4th ed.). Thousand Oaks, CA: Sage.

Course Prerequisite:

All students must have completed an undergraduate course in research methods and statistics. This is the absolute minimum requirement. Students who only meet the basic requirement will probably not do well in this course. Preferably, students should have also completed (and received a good grade) SOC 4570 Quantitative Social Analysis or an equivalent senior undergraduate stats/methods course.

Course Objectives and Description:

This is an advanced quantitative course in research methods. Emphasis will be placed on the practical application of statistical techniques, and students will have ample opportunity to apply these methods to data. Students should be proficient with SPSS as this software will be used extensively in the course.

The objective of this course is to cover a range of multivariate topics and techniques using a conceptual, rather than mathematical, approach. Sociology students are not, nor are they likely to become statisticians.

Accordingly, the focus in this course is on *applied* multivariate research methods, this means we will emphasize design and interpretation rather than mathematical computations and derivations.

It is expected that students will have a comprehensive understanding of univariate and bivariate research methods. In particular students should have a strong grasp of the following material: levels of measurement, descriptive statistics, inferential statistics, analysis of variance (ANOVA), bivariate categorical data, and bivariate correlation and regression.

In order to ensure that students possess adequate comprehension of these basic topics, it is probably a good idea for them to reacquaint themselves with their undergraduate methods/stats texts. For individuals who are still not confident with statistical reasoning, I suggest either of the following:

Field, A. (2009). *Discovering Statistics Using SPSS* (3rd ed.). Thousand Oaks, CA: Sage.

Sirkin, M. (2005). *Statistics for the Social Sciences* (3rd ed.). Thousand Oaks, CA: Sage.

Given that this is an advanced course, our primary focus will be on multivariate statistical techniques. Specific topics to be covered include:

- Checking Statistical Assumptions
- Dealing with Missing Data
- Interaction Terms (Moderation) in OLS regression
- Mediation Analysis in OLS regression
- Logistic Regression
- Multilevel Modelling
- Path Analysis
- Principal Components and Exploratory Factor Analysis
- Confirmatory Factor Analysis
- Structural Equation Modelling
- Latent Growth Curve Analysis

Grade Distribution:

A+	=	90% and over	4.5
A	=	80% to 89%	4.0
B+	=	75% to 79%	3.5
B	=	70% to 74%	3.0
C+	=	66% to 69%	2.5
C	=	60% to 65%	2.0
D	=	50% to 59%	1.0
F	=	Under 50%	0.0

Students should be aware that the above grade categories are only guidelines. Different cut-off percentages may be used depending on the final grade distribution.

Course Evaluation:

Data Processing Using SPSS Syntax	February 1	15%
Ownership of a Multivariate Technique	Jan 25 – Mar 22	30%
Research Project	April 15	55%

Data Processing Using SPSS Syntax: Students will be given an SPSS data file (.sav) that they are to prepare for multivariate data analyses. Tasks will include labeling data, cleaning data, dealing with missing data, checking assumptions, creating variables, and saving specified variables. Additional information for this assignment will be given in class.

Ownership of a Multivariate Statistic: Research shows that students tend to attain better understanding of material when they are required to *actively* teach it to others compared to *passively* receiving it in lecture format. Accordingly, this course will follow a traditional graduate seminar format where each student will be required to take ownership of one multivariate technique and teach it to the class. A list of multivariate techniques will be distributed and students are to select the one that they wish to teach. Details will be discussed in class and the instructor reserves the right to adjudicate final teacher-topic selections. Further details will be discussed in class.

Research Project: Students will be required to design and develop a research project using secondary data. Students are responsible to select a data set to analyze. The research project will involve generating testable research hypotheses that can be empirically evaluated. Students must select at least one multivariate statistic discussed in class, but not the research method that they taught in class. Students must also create at least one composite index for their final research paper, and some evidence must be given for its shared variance. More details will be provided in class.

There are plenty of places to find a secondary data set. Below are some suggested data sources:

University of Manitoba Data Library (Gary Strike)

<http://www.umanitoba.ca/libraries/units/datalib/>

Canadian Opinion Research Archive

<http://www.queensu.ca/cora/ces.html>

Council of European Social Science Data Archives

<http://www.cessda.org/accessing/catalogue/index.html>

The National Archive of Criminal Justice Data (US)

<http://www.icpsr.umich.edu/nacjd>

The World Values Survey

<http://www.wvsevsdb.com/wvs/WVSDData.jsp>

Late Assignments and Papers:

Late papers and assignments will be penalized 10% per day (including weekends and holidays) unless permission is granted *prior* to the due date. Note that such permission is only granted for exceptional circumstances. Papers or assignments more than five days late will not be accepted.

Sequence of Topics:

- 1) Review of Statistics
 - useful terms and definitions
 - review of univariate and bivariate statistics
- 2) OLS Regression (main effects)
- 3) Meeting Assumptions: Screening Data Prior to Analyses
- 4) Introduction to SPSS Syntax
- 5) Individual Presentation of Selected Multivariate Techniques (Beginning Jan 25th)
- 6) Individual Presentations of Final Research Paper

Student Conduct and Academic Regulation of the University:

Voluntary Withdrawal:

The final date for voluntary withdrawal from this course is March 20th, 2013.

Academic Integrity:

Students should acquaint themselves with the online University of Manitoba Academic calendar and Catalog: <http://umanitoba.ca/calendar> and refer to the section on General Academic Regulation: Section 5 - **Academic Evaluation: Personation at Examinations (Section 5.2.9)** and Section 8 - Academic Integrity - **Plagiarism and Cheating (Section 8.1)**

Accommodations:

Special Needs: Special needs services are provided through Disability Services (474-6213). Students with special needs (who require aids, other supports, or require extra time to write a test) should introduce themselves to the instructor at the beginning of the term in order to arrange suitable testing times.

Holy Days: The university recognizes the right of all students to observe recognized holidays of their faith, which fall within the academic year. With instructor discretion, necessary arrangements can be made to ensure studies are not jeopardized. The instructor should be notified of a student's intended absence in advance. At least three weeks notice of absence should normally be given where special arrangements are sought.

Selected Readings:

The following is a selection of supplementary references that students may find useful to help increase their understanding of the topics, during the course and in future.

- Agresti, A. (2007). *An Introduction to Categorical Data Analysis* (2nd Ed.). New York: Wiley.
- Bryk, A.S., and Raudenbush. (2002). *Hierarchical Linear Models* (2nd Ed.). Thousand Oaks: Sage.
- Byrne, B. M. (2010). *Structural Equation Modeling With AMOS: Basic Concepts, Applications, and Programming* (2nd Ed.). New York: Routledge.
- Cohen, J., Cohen, P., West, S.G., & Aiken, L.S. (2003). *Applied Multiple Regression/Correlation Analysis for the Behavioural Sciences*, (3rd Ed.). Mahwah, NJ: LEA.
- Duncan, T.E., Duncan, S.C., & Strycker, L.A. (2006). *An Introduction to Latent Variable Growth Curve Modeling: Concepts, Issues, and Applications* (2nd ed.). Mahwah, NJ: LEA.
- Enders, C.K. (2010). *Applied Missing Data Analysis*. New York: Guilford Press.
- Gelfand, L.A., Mensinger, J.L., & Tenhave, T. (2009). Mediation analysis: A retrospective snapshot of practice and more recent directions. *Journal of General Psychology*, 136(2), 153–176.
- Graham, J.W. (2009). Missing data analysis: making it work in the real world. *Annual Review of Psychology*, 60, 549-576.
- Hox, J. (2010). *Multilevel Analysis: Techniques and Applications* (2nd Ed.). New York: Routledge.
- Jaccard, J. (2001). *Interaction Effects in Logistic Regression*. Sage Series: Quantitative Applications in the Social Sciences. Thousand Oaks: Sage.
- Jaccard, J., & Turrisi, R. (2003). *Interaction Effects in Multiple Regression* (2nd Ed.). Sage Series: Quantitative Applications in the Social Sciences. Thousand Oaks: Sage.
- Keith, T.Z. (2005). *Multiple Regression and Beyond*. Boston: Allyn & Bacon.
- Kline, R.B. (2011). *Principles and Practice of Structural Equation Modeling* (3rd Ed.). New York: Guilford Press.
- Knoke, D., & G. W. Bohrnstedt, and A.P. Mee. (2002). *Statistics for Social Data Analysis* (4th Ed.). Itasca, IL: F. E. Peacock Publishers, Inc.
- Lawal, B. (2003). *Categorical Analysis with SAS and SPSS Applications*. Mahwah, NJ: LEA.
- Loehlin, J.C. (2004). *Latent Variable Models: An Introduction to Factor, Path, and Structural Equation Analysis* (4th Ed.). Mahwah, NJ: LEA.
- Luke, D.A. (2004). *Multilevel Modeling*. Sage Series: Quantitative Applications in the Social Sciences. Thousand Oaks: Sage.
- McDonald, R.P. (1996). Path analysis with composite variables. *Multivariate Behavioral Research*, 31(2), 239-270.
- MacKinnon, D.P. (2008). *Introduction to Statistical Mediation Analysis*. New York: LEA.

- Menard, S. (2002). *Longitudinal Research* (2nd Ed.). Sage Series: Quantitative Applications in the Social Sciences. Thousand Oaks, CA: Sage.
- Menard, S. (Ed.). (2008). *Handbook of Longitudinal Research: Design, Measurement, and Analysis*. New York: academic Press.
- Menard, S. (2010). *Logistic Regression: From Introductory to Advanced Concepts and Applications*. Thousand Oaks, CA: Sage.
- Miles, J., & Shevlin, M. (2001). *Applying Regression and Correlation: A Guide for Students and Researchers*. London: Sage.
- Morgan, S.E., Reichert, T., & Harrison, T.R. (2002). *From Numbers to Words: Reporting Statistical Results for the Social Sciences*. Boston: Allyn and Bacon.
- Pett, M.A., Lackey, N.R., & Sullivan, J.J. (2003). *Making Sense of Factor Analysis*. Thousand Oaks, CA: Sage.
- Preacher et al. (2008). *Latent Growth Curve Modeling*. Sage Series: Quantitative Applications in the Social Sciences. Thousand Oaks, CA: Sage.
- Rucker, D. D., Preacher, K. J., Tormala, Z. L., & Petty, R. E. (2011). Mediation analysis in social psychology: Current practices and new recommendations. *Social and Personality Psychology Compass*, 5/6, 359–371.
- Schlomer, G. L., Bauman, S., & Card, N. A (2010). Best practices for missing data management in counseling psychology. *Journal of Counseling Psychology*, 57, 1-10.
- Schumacker, R.E., & Lomax, R.G. (2010). *A Beginner's Guide to Structural Equation Modeling* (3rd Ed.). New York: LEA.
- Singer, J.D., & Willet, J.B. (2003). *Applied Longitudinal Data Analysis*. New York. Oxford University Press.
- Snijders, T.A.B., & Bosker, R.J. (2012). *Multilevel Analysis: An Introduction to Basic and Advanced Multilevel Modeling*. Thousand Oaks, CA: Sage.
- Spicer, J. (2005). *Making Sense of Multivariate Data Analysis*, Thousand Oaks: Sage.
- Thompson, B. (2004). *Exploratory and Confirmatory Factor Analysis: Understanding Concepts and Applications*. Washington, DC: APA.