

**PUBP 804 MULTIVARIATE STATISTICAL ANALYSIS IN PUBLIC POLICY
Spring 2004**

INSTRUCTOR:

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TIME & PLACE: Wed 4:30 – 7:10 pm Aquia Module 103

PREREQUISITE: PUBP 704 or equivalent

COURSE DESCRIPTION: The course examines the major techniques of multivariate statistical analysis in the social sciences, with emphasis on the applications in policy studies. The course begins with a brief review of research design and the fundamentals of statistical analysis, and then moves on to the major multivariate techniques commonly used in policy research. The course covers the logic of causal analysis using multivariate cross-tabulations, reliability theory and validity assessment, factor analysis and construction of factor scales, bivariate and multivariate regression, path analysis and structural equations, and the analysis of variance and covariance. The course stresses applications and interpretations over mathematical foundations, and in particular it will emphasize the application of multivariate statistics to a real, complex database using an advanced statistical package.

EVALUATION: The grade will be based on homework assignments (30%), a midterm (30%), and a final examination (40%). The midterm will cover the first half of the course (roughly) and the final exam will cover somewhat more than the last half of the course.

REQUIRED TEXTS:

1. Hutcheson and Sofroniou, *The Multivariate Social Scientist*, SAGE Publications
ISBN: 0761952012
2. Maruyama, *Basics of Structural Equation Modeling*, SAGE Publications
ISBN: 0803974094
3. Hamilton, *Statistics with Stata 8*, Duxbury Press ISBN: 0-534-99756-2
4. Reynolds, *Analysis of Nominal Data*, SAGE Publications
ISBN: 0803906536
5. Carmines and Zeller, *Reliability and Validity Assessment*, SAGE Publications
ISBN: 0803913710

Selected readings from Stata manuals and data codebooks

Handouts from various sources and readings on reserve in the library

TOPICS AND READINGS:

- January 21 Introduction to multivariate analysis; definitions of data and quantitative techniques; discussion of computer-based data analysis, **computer lab**
- January 28 Brief review of research designs, descriptive statistics, and the introduction to data analysis with Stata
Hamilton, Ch. 1; Ch. 2 p. 12-28; Ch. 3 p. 58-72
- February 4 Analysis of nominal data and contingency tables (cross-tabs); more on Stata
Reynolds, *Analysis of Nominal Data*
Hamilton, Ch. 4
Selected chapters from Stata manuals
- February 11 Statistical tests and measures of association for contingency tables; **computer lab**
- February 18 Reliability and validity of social measurement
Carmines & Zeller, *Reliability and Validity Assessment*
Hutcheson, Ch. 2.1 to 2.5
- February 25 Principle components, factor analysis, and rotations
Hutcheson, Ch. 6
Hamilton, Ch. 12
- March 3 Factor analysis application and factor scaling; **computer lab**
Armor, "Factor Scaling and Theta Reliability" (via email)
Maruyama, Ch. 7
- March 10 [RECESS]
- March 17 Review, midterm
- March 24 Multiple regression analysis
Hutcheson, Ch. 3
Hamilton, Ch. 6, 7

- March 31 Path analysis and structural equations
Maruyama, Ch. 3, 4, & 6
- April 7 Logistic regression and other nonlinear regression
Hutcheson, Ch. 4
Hamilton, Ch. 10 then Ch. 9
- April 14 Analysis of variance and covariance
Handout (basis equations and steps in ANOVA)
Hamilton, Ch. 5
- April 21 Selected advanced multivariate techniques
Hutcheson, Ch. 7
Maruyama, Ch. 8,9
- April 28 Review; final