

SYLLABUS

Psychology 513 - Quantitative Models in Psychology

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Texts: Kutner, M.H., Nachtsheim, C.J. & Neter, J. (2004). *Applied linear regression models, fourth edition*. New York: McGraw-Hill/Irwin **OR** Kutner, M.H., Neter, J., Nachtsheim, C.J. & Li, W. (2004). *Applied linear statistical models, 5th international edition*. New York: McGraw-Hill/Irwin.

JMP Statistical Discovery Software, by SAS Institute.

(available through UL site license at <http://helpdesk.louisiana.edu>)

Course Description

This course is designed to serve two main purposes. One objective is to provide an introduction to multiple correlation/regression and general linear models as basic analytical tools in psychological research. The other main objective is to familiarize students with a statistical package (JMP) available here and widely used throughout the country. Students should gain the practical skills necessary to enter, analyze, and interpret results for a variety of data sets using this package.

The first part of the course includes an introduction to the JMP statistical package mentioned above. Students use JMP to do familiar descriptive statistics, data screening, histograms, scatterplots, *t*-tests, etc.

A review of bivariate correlation and regression comes next if the backgrounds of the students require it. Topics covered include the relationship between correlation and regression, relevance of assumptions, effects of outliers, hypothesis testing, effects of measurement error and restricted variability, matrix formulation of regression analysis, the relation between dummy variable regression and *t*-test, and the interpretation of computer output including residual plots.

The remainder of the course is devoted to multiple regression and closely related topics. Consideration is given to the meaning and interpretation of regression weights, part and partial correlations, enhancer and suppressor effects, stepwise regression, multicollinearity problems, polynomial, interactive and nonlinear regression, logistic regression, analysis of covariance, and the relationship between regression and analysis of variance. Two exams, a midterm and a final, are given along with numerous homework assignments involving use of the computer to illustrate the theoretical aspects of the course.

Emergency Evacuation Procedures: A map of this floor is posted near the elevator marking the evacuation route and the **Designated Rescue Areas**. These are areas where emergency service personnel will go first to look for individuals who need assistance in exiting the building. Students who may need assistance should identify themselves to the teaching faculty.

READING ASSIGNMENTS

Sections to be covered in Kutner, M.H., Nachtsheim, C.J. & Neter, J. (2004). *Applied linear regression models, fourth edition*.

Appendix A - Basic Results

A.1, A.3-A.7

Chapter 1 - Linear Regression with One Independent Variable

All sections

Chapter 2 - Inferences in Regression Analysis

All sections

Chapter 3 - Diagnostics and Remedial Measures

3.1-3.4, 3.8

Chapter 4 - Effect of Measurement Errors

4.5

Chapter 5 - Matrix Approach to Regression Analysis

All sections

Chapter 6 - Multiple Regression - I

6.1-6.6, 6.9

Chapter 7 - Multiple Regression - II

All sections

Chapter 8 - Regression Models for Quantitative and Qualitative Predictors

All sections

Chapter 9 - Building the Regression Model I: Model Selection and Validation

9.4-9.5

Chapter 14 - Logistic Regression, Poisson Regression, and Generalized Linear Models

14.1-14.4