

Psychology 515 - Experimental Design

Syllabus - Fall 2011

Instructor: Bob McFatter

Office: Girard Hall 222A Phone: 482-6589 (office); 981-1694 (home)

Internet page: www.ucs.louisiana.edu/~rmm2440/

E-mail: mcfatter@louisiana.edu

Texts: Keppel, G. and Wickens, T.D. (2004). *Design and analysis, 4th ed.*, Englewood Cliffs, NJ: Prentice-Hall.

JMP 9, Statistical Discovery Software, by SAS Institute.

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

Class Notes (handout)

Objective of course: The purpose of this course is to provide the student with a working knowledge of commonly used techniques for designing and analyzing experiments in psychology. Primary emphasis is given to both practical and theoretical considerations in the use of analysis of variance procedures in designing experiments and interpreting the results. Emphasis will be given to using the JMP statistical package for carrying out analyses discussed. The first part of the course includes an introduction to the JMP statistical package. Students use JMP to do familiar descriptive statistics, data screening, histograms, scatterplots, *t*-tests, as well as analysis of variance.

Topics to be covered:

Random variables, expected values, sampling distributions, notation, logic, & computations for completely randomized one-way design

Effects of, and tests for, violations of assumptions, transformations to meet assumptions

Planned and post hoc comparisons, orthogonal contrasts including trend analyses

Power analysis of hypothesis tests, magnitude of effects estimation, expected mean squares

Factorial designs, estimation and interpretation of main effect and interaction parameters, interpretation of complex contrasts

Crossed and nested factors, fixed vs. random effects designs, randomized blocks designs

Generation of models and expected mean squares for complex designs including repeated measures and split-plot designs, choice of appropriate error terms in complex designs

Additional useful sources in the library:

Lindman, H. R. (1974). *Analysis of variance in complex experimental designs*. San Francisco: Freeman.

Maxwell, S.E. & Delaney, H.D. (1990). *Designing experiments and analyzing data*. Belmont, CA: Wadsworth.

Myers, J. (1979). *Fundamentals of experimental design, 3rd ed.* Boston: Allyn & Bacon.

Winer, B.J., Brown, D.R. & Michels, K.M. (1991). *Statistical principles in experimental design, 3rd ed.*, New York: McGraw-Hill.

Grades will be based on three equally weighted exams.

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.