STATISTICAL METHODS II
STAT 3010/8015

Prerequisites: STAT 3000 or equivalent

Credit Hours: 3 hours

Catalog Description: Analysis of Variance, Simple Linear Regression, Multiple Regression, Categorical Data Analysis, Nonparametric Statistics, Minitab, SPSS, SAS, and Excel are used in the course when appropriate.

For Whom Intended: For students from all disciplines who desire further knowledge of statistical methods than that provided by Statistical Methods I.

Objectives: To introduce students to statistical tests and procedures and to acquaint them with various statistical packages. Additional aspects of the packages Minitab, SPSS, SAS, and Excel will be investigated in the course.

Topics:

1. Completely randomized designs, multiple comparisons of means, randomized block designs, factorial designs.
2. Least squares approach to fitting a model, assessing the utility of a model, correlation coefficient, coefficient of determination, using the model for estimation and prediction.
3. Multiple regression models, first order model, estimating and interpreting the beta parameters, inferences about the beta parameters, overall utility of the model, using the model for estimation and prediction, interaction models, quadratic and other higher order models, dummy variables, models with both quantitative and qualitative models, nested models, checking the regression assumptions, multicollinearity and extrapolation.
4. Categorical data and the multinomial experiment, one-way table, two-way table.
5. Sign test, wilcoxon rank sum test, wilcoxon signed rank test, kruskal-wallis test, freidman test, spearman's rank correlation coefficient.

Evaluation and Grading:

The course is graded by giving a midterm and final exam and several package assignments.

Methods of Instruction:

The class is primarily in lecture form.

Text: McClave and Sincich, *Statistics*, 9th ed.

Bibliography:

Mendehall, W., Beaver, R.J., and Beaver, B. *Introduction to Probability and Statistics,* 10th ed. North Scituate, Mass. Duxbury, 1999.

Snedecor, G. W. and Cochran, W. G., *Statistical Methods*, 7th ed. Ames: Iowa State University Press, 1980.

Steel, R.G. and Torrie, J.H. *Principles and Procedures of Statistics*, 2nd ed. New York: Mcgraw- Hill.1980.

Mendenhall, W. and Sincich, T.A., *A Second Course in Statistics: Regression Analysis*, 5th ed. Upper Saddle River, N.J. Prentice Hall, 1996.

McClave, J.T. and Sincich, Terry, *Statistics*, 9th ed. Upper Saddle River, N.J. Prentice Hall, 2003.