Course Title: Multivariate Analysis

Number of Credits: 3 S.H.

Catalog Description: Statistical analysis of multivariate data. Topics will include preparation of data for analysis, selection of techniques appropriate to research questions, measures of association for continuous and discrete variables, Hotelling’s T² statistic, MANOVA, MANCOVA, discriminant analysis, principal component analysis, factor analysis, multidimensional scaling, and cluster analysis. This is a computer-orientated course with emphasis on application.

Prerequisite: MATH 130 or MATH 270, STAT 360 or instructor’s permission. Offered alternate spring semesters.

Possible Textbooks:


Topics Covered:

A. Introduction to Multivariate Analysis
B. Matrix Algebra and Random Vectors
C. Inferences about a Mean Vector
   1. Hotelling’s T²
   2. Testing
   3. Estimation
D. Comparing Several Multivariate Means
   1. Repeated Measures Analysis
   2. MANOVA
   3. Profile Analysis
E. Principal Component Analysis
F. Factor Analysis
G. Discriminant Analysis and Classification
   1. Fisher’s Discriminant Function
   2. Linear Discriminant Analysis
   3. Quadratic Discriminant Analysis
   4. Classification Trees
5. Logistic Regression

H. Clustering
1. Similarity Measures
2. Hierarchical Clustering Methods
3. Nonhierarchical Clustering Methods
4. Multidimensional Scaling

I. Other topics may include (time permitting):
1. Canonical Correlation Analysis
2. Correspondence Analysis
3. Neural Networks
4. Advanced Methods of Discriminant Analysis

Method of Instruction: Lectures, case studies, discussion, group work, problem solving sessions, and computer sessions.

Evaluation Procedures: Exams, quizzes, projects, and/or homework.

Computer Software:
- SAS/JMP Professional Version *
- R or S-Plus Version 6.1 for Windows *
- SAS for Windows *
- SPSS for Windows
- MINITAB 14.0 for Windows
  * recommended