A Course for Fall 2014

Math 380 - Topics in Math:

Applied Multivariate Statistics

12:30 PM - 01:20 PM, STURGS 208A

Rationale for Proposal

Multivariate data analysis is a central tool whenever many variables need to be considered at the same time. It is the extension of common univariate statistical procedures to analogous multivariate techniques that involve several dependent variables. Currently, the mathematics department doesn't have such a course that extends the depth of applied statistics topics in Math 262, Math341 and Math361 in multivariate sense as well as introduces new methods in data analysis.

Description

This is an upper level undergraduate course in applied statistics. The course will explore multivariate methodologies in statistics, placing an emphasis in real-life situations. Topics include multivariate normal distributions and statistical tests, problems specific to multivariate data such as multivariate regression, discrimination and classification, principal component analysis, cluster analysis and recent approaches to multivariate data analysis. Computations will be implemented in R (or your preference).

Students from all majors are welcome.

Prerequisites:

MATH 233 (Linear Algebra I) and any statistics course at a 200- or 300- level, or permission of the instructor. Students who will be taking Math 233 in Fall 2014 are welcome, too.

Tentative Topics

Topics include:

- (Matrix Review)
- Characterizing and Displaying Multivariate Data
- The Multivariate Normal Distribution
- Tests on One or Two Mean Vectors
- Multivariate Analysis of Variance
- Tests on Covariance Matrices
- Discriminant Analysis
- Classification Analysis
- Multivariate Regression
- Canonical Correlation
- Principal Component Analysis
- Exploratory Factor Analysis
- Confirmatory Factor Analysis
- Cluster Analysis
- Graphical Procedures and Recent Approaches to Multivariate Data Analysis

For more information please contact Yusuf Bilgic, South Hall 324A, 245-5484, bilgic@geneseo.edu