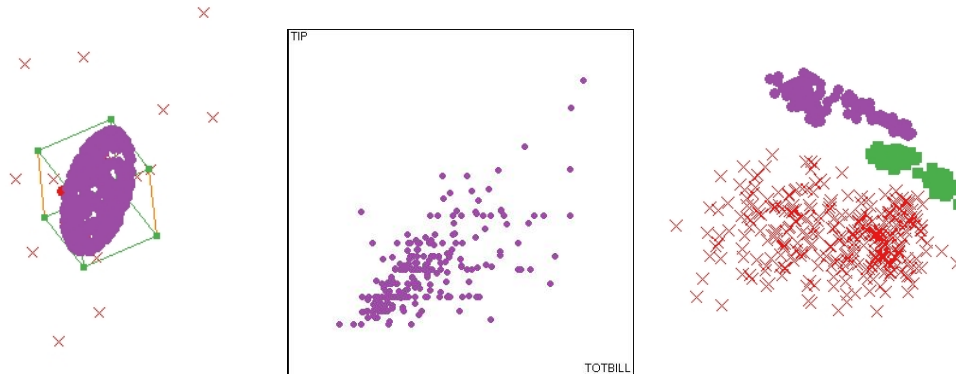


## Statistics 501 - Multivariate Statistical Methods Syllabus Spring 2003

*Course Description:* In this course students will learn about statistical methods for data that contains more than one variable. Topics include dimension reduction using principal components analysis and factor analysis, case reduction using cluster analysis, supervised classification with neural networks and trees. Inferential methods based on the assumption of multivariate normally distributed population will be discussed. Graphics will be heavily utilized in all topics.

Meeting times: MWF 1:10-2:00pm  
Location: Howe 1304  
Instructor: Dr Dianne Cook, 325 Snedecor Hall,  
515 294 8865, [dicook@iastate.edu](mailto:dicook@iastate.edu)  
Office hours: MWF 10:00-10:50am or by appointment  
Teaching assistant:  
Text book: Applied Multivariate Statistical Analysis,  
Johnson and Wichern, 2001 (5th ed)



### *Schedule of topics:*

Introduction  
Graphics  
Multivariate Normal  
Inference for the population mean  
Handling Missing Values  
Comparing several population means  
Principal Component Analysis  
Supervised Classification  
Unsupervised Classification  
Factor Analysis  
Multidimensional scaling  
Canonical Correlation

*Course Goals:* The objectives of the course are to help students:

1. grasp the concepts and develop critical thinking in multivariate statistical analysis.
2. learn about multivariate problems.
3. compute analyses using standard statistical software.
4. learn sufficient vocabulary to read further about new methodology.
5. apply the methodology to new problems.

*Computing:* Software used will be S-Plus and GGobi on PCs. Information on using each of the packages for particular exercises and sample code will be provided by the instructor. The packages have online help. GGobi is free software for multivariate graphics (available from [www.ggobi.org](http://www.ggobi.org)). S-Plus provides student copies at discount prices but there is also a free version called R (available from [www.R-project.org](http://www.R-project.org)).

The lab PCs have zip drives. Your own personal zip disk ensures that you have the data available after the lab work for additional exercises or subsequent labs. You will need to buy zip disk to use in labs for saving data and analysis code for use in subsequent labs.

*Course Grades:* Computed from a total of 200pts made up of bi-weekly homeworks (40pts), small review quizzes, (3@10pts=30pts), one mid-term exam (60pts) and a final exam (70pts). Review quizzes will be randomly given. Homeworks will require some computing.