Instructor: Adele Cutler
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Office hours: MWF 11:00–12:00

Schedule: TH 10:30–11:45, AGSC 338.

Course Objectives: The objective of this class is to give you an introductory working knowledge of multivariate data analysis so that you can understand the literature and be able to appropriately analyze many types of multivariate data. The emphasis will be on developing a sound understanding of the methods and of when they should and should not be employed. Verbal and geometrical explanations will be stressed and only a minimal amount of mathematical background will be expected. Instruction on R will be provided and students will be required to use R for homework. Students may choose to use SAS for the project, with permission of the instructor.

Prerequisites: Stat 3000 and Stat 5100 or 5200. The statistics 5100 or 5200 prerequisite is FIRM and will only be waived in exceptional circumstances (e.g. the student has taken a class similar to stat 5100 or 5200 at another institution).


Grades: Grades will be based on performance in homework assignments (40%) and a term project (60%). The project will require the use of one or more multivariate analysis techniques to analyze a set of data selected by the student. Alternatively, a simulation study may be performed. A project proposal, describing the data and sketching at least one potential method of analysis, must be submitted by Feb 26. Students are required to prepare a poster and to explain their poster to the instructor and to other students at poster sessions during class time on April 22, 27, or 29. Students should plan to attend all the poster sessions, even though their poster will only be featured in one of these sessions. A written project report is due April 30, in which the data are described in context, the analysis is presented and discussed, and the conclusions are clearly stated, both statistically and practically.

Topics include:
Visualizing multivariate data
Principal components analysis
Multidimensional scaling
The lasso
Multivariate regression and canonical correlation
Discriminant analysis
Classification and regression trees
Cluster analysis
Factor analysis