Sta 764: Regression and Multivariate Analysis II

where: CBC C321

when: 4 - 5:15 pm TR

instructor: Anton Westveld

anton.westveld@unlv.edu

http://faculty.unlv.edu/westveld/Teaching/Sta764/sta764.html

Topics Covered:

Based on the pace of the class, we will cover many of the topics traditionally associated with multivariate analysis:

- Graphical methods for multivariate data
- Matrix algebra
- Multivariate Gaussian distribution
- Multivariate linear regression
- Principle components
- Factor analysis
- Discriminate Analysis
- Multidimensional scaling

Additionally, time permitting, I hope to explore a few other topics:

- Missing data (multivariate Gaussian)
- Graphical models (multivariate Gaussian)
- Rubin and Pearl causal frameworks

Format:

This is a course in statistical methodology and thus will be a mix of theory, application, and computing. The statistical package used in this course is **R** which is freely available at www.r-project.org.

Books:

The required book for this course is 'Applied Multivariate Statistical Analysis' by Johnson and Wichern (6th edition).

Other books that may be of interest now and in the future:

- Traditional multivariate analysis:
  - 'An Introduction to Multivariate Statistical Analysis' by Anderson
  - 'An R and S-PLUS Companion to Multivariate Analysis' by Everitt (The UNLV library has this book on-line.)
  - 'Multivariate Analysis' by Mardia. Kent, and Bibby
  - 'Methods of Multivariate Analysis' by Rencher
- Missing data:
  - 'Statistical Analysis with Missing Data' by Little and Rubin

- Graphical models:
  - 'Introduction to Graphical Modelling' by Edwards
  - 'Graphical Models' by Lauritzen
  - 'Graphical Models in Applied Mathematical Multivariate Statistics' by Whittaker
- Regression analysis:
  - 'Linear Model with R' by Faraway
  - 'Extending the Linear Model with R' by Faraway
  - 'Data Analysis Using Regression and Multilevel/Hierarchical Models' by Gelman and Hill
  - 'Generalized Linear Models' by McCullagh and Nelder
- R:
  - The books mentioned above by Faraway.
  - 'Modern Applied Statistics with S-Plus' by Venables and Ripley
  - 'An Introduction to R'

Assesment:

The requirements for this course are simple – attend class, complete the assignment, and take the exams. This is a lecture-based workshop, which will proceed as quickly or slowly as is necessary. Some assignments will be computational or analytical in nature, similar to those from last semester. Others will involve writing short essays or research notes. Many will come from the textbook. Clarity of presentation and argument are of utmost importance when preparing these assignments. There will be an assignment approximately every week or so. Assignments count for 50% of the final course grade. The late policy for assignments is that each turned in item receives an initial grade of x, then the actual grade is $y = x \exp(-d/10)$, where d is the number of days after the due date I receive the work. Everyone receives one grace day to be applied to one homework for the entire quarter. **I encourage students to work on the assignments together, but students must hand in their own work.**

There will also be two written examinations: a mid-term and a final. The midterm exam is worth 20% of the final grade, and the final exam is worth 30%. Grades will be assigned based on the written assignments and the examinations. Details are to follow.

Office Hours:

My office is B211 in Carol C. Harter Classroom building. My suggested office hours are 3:30 - 5:00 on Monday and Wednesday. This will discussed the first day of class. Also by appointment.

Please Note:

The Disability Resource Center (DRC) coordinates all academic accommodations for students with documented disabilities. The DRC is the official office to review and house disability documentation for students, and to provide them with an official Academic Accommodation Plan to present to the faculty if an accommodation is warranted. The DRC strongly encourages faculty to provide accommodations only if and when they are in receipt of said plan. Faculty should not provide students accommodations without being in receipt of this plan.

UNLV complies with the provisions set forth in Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, offering reasonable accommodations to qualified students with documented disabilities. If you have a documented disability that may require accommodations, you will need to contact the DRC for the coordination of services. The DRC is located in the Student Services Complex (SSC), Room 137, and the contact numbers are: VOICE (702) 895-0866, TTY (702) 895-0652, FAX (702) 895-0651. For additional information, please visit: http://studentlife.unlv.edu/disability/