

# STAT 567: Applied Multivariate Analysis

Spring 2014, Thursday 6:40-9:30, SEC 206 BUS

- Instructor: Dan Yang
- Office: Hill Center 453
- Office hours: Wednesday 2-3pm or by appointment
- Email: [stat567.spring2014@gmail.com](mailto:stat567.spring2014@gmail.com) (for submitting hw etc.) or [dyang@stat.rutgers.edu](mailto:dyang@stat.rutgers.edu) (urgent)
- Required Textbook: Applied Multivariate Statistical Analysis, by Richard A. Johnson and Dean W. Wichern; 6th edition; Prentice Hall
- Software: R. Free software available at <http://www.r-project.org/>. If you go to Manuals on the left panel of the website, you will find a good introduction *An Introduction to R*.
- Course website: <http://www.stat.rutgers.edu/home/dyang/567.html>
- Grades: 20% homework + 10% participation + 30% midterm + 40% final
- Homework: some problems are from the textbook and the grade will reflect completeness and timeliness, not correctness. You are encouraged to work together to master these exercises, but must turn in your own answers. Some of the homework questions will be given as exam questions. No late homework will be accepted. Homework is due in class.
- The midterm: open book, 2 hours, Thursday in class, March 27th. No late or early exams will be possible, so please do not plan travel before verification of the dates.
- The final: open book, 3 hours, Thursday May 8, 8-11pm. No late or early finals will be possible, so please do not plan travel before verification of the dates.
- Course Objective:
  - To learn basic techniques for analyzing multi-dimensional data (including visualization)
  - To study multivariate distributions and their properties, especially Gaussian distribution
  - To understand multivariate statistical inference and applications in scientific fields
  - To discuss various methods for dimension reduction, including principal component analysis, factor analysis, canonical correlation analysis, discriminate analysis, multi-dimensional scaling, etc.

## Tentative Schedule

Week	Date	Topic	Note	Due
1	01/23	Preliminary (Chap. 1-3)		
2	01/30	Preliminary+Multivariate normal (Chap. 4)		
3	02/06	Multivariate normal (Chap. 4)		HW1
4	02/13	Inference about mean (Chap. 5-6)		
5	02/20	Inference about mean (Chap. 5-6)		HW2
6	02/27	Inference about mean (Chap. 5-6)		
7	03/06	Principal component analysis (Chap. 8)		HW3
8	03/13		No class	
9	03/20		No class: spring recess	
10	03/27	Factor analysis (Chap. 9)	Mitem	HW4
11	04/03	Factor analysis (Chap. 9)		
12	04/10	Canonical correlation analysis (Chap. 10)		HW5
13	04/17	Discrimination and classification (Chap. 11)		
14	04/24	Discrimination and classification (Chap. 11)		HW6
15	05/01	Clustering (Chap. 12)		
16	05/08		Final	