

# Statistics 925: Multivariate Statistics

Syllabus, Fall 2011

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**Classes:** Mon/Wed 1:30–3:00 p.m., in G86 JMHH

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**Office:** 468 JMHH

**Office hours:** Wed 3–4 p.m., or by appointment

## Course overview

The analysis of multivariate data is an important subject in statistics.

The current course will first cover a list of classical multivariate statistical methods. Topics will include the multivariate normal distribution and the Wishart distribution; estimation and hypothesis testing; principal component analysis; canonical correlation analysis; discriminant analysis; clustering; multidimensional scaling, etc.

Time permitting, the course will go further toward the field of high-dimensional statistical inference, where the number of variables is comparable to, or even much larger than, the number of observations. The major topic here will be estimation and hypothesis testing of covariance matrices.

## Textbook and references

There is no required textbook for the course. The following two books are recommended:

- *Multivariate Analysis*, by K.V. Mardia, J.T. Kent, and J.M. Bibby. Academic Press, 1979.
- *An Introduction to Multivariate Statistical Analysis, 3rd Ed.*, by T.W. Anderson, Wiley, 2003.

Either one makes an excellent reference for future work. The Lippincott Library has both books on reserve on the library use only reserve shelves. Students can ask for them under the author's last name.

## Course requirement

There will be occasional homework problems and no exam. Students will be expected to make a presentation in the later part of the course. A list of possible topics for presentation will be made available. Evaluation will be based on homework completion, presentation, and class participation.

## Course prerequisites

Stat 550 and linear algebra. Familiarity with basic asymptotic theory will be helpful, but is not required.