Statistics 525	Multivariate Analysis

(see Course Descriptions for the applicable academic year: http://www.ucalgary.ca/pubs/calendar/)

Reference Text: Applied Multivariate Statistical Analysis, 5th edition, by Johnson and Wichern
    (not necessarily a required text)

Syllabus

Topics	Number of Hours
Review of univariate, bivariate distributions, pdf, cdf, mgf. Normal, bivariate Normal, Gamma, t, χ^2, F, multinomial.	2
Random vectors and matrices. Mean vectors, covariance matrices. Linear transformations. Positive definite matrices, quadratic forms.	3
Multivariate Normal distribution: pdf, mgf, properties. Ellipsoids of constant probability, eigenvalues/eigenvectors of matrices. MLE's for μ and Σ. Random samples, sample mean, sample covariance matrix. The Wishart distribution, properties (including distribution of diagonal submatrices). Assessing normality.	8
Inferences about population mean vectors: Hotelling's T^2. Likelihood ratio tests. Confidence regions, simultaneous confidence intervals (Scheffé, Bonferroni). Large sample inference for population mean vectors, proportions. Missing observations.	6
Paired comparisons, independent samples. Repeated measures comparisons. Review of one-way ANOVA. One-way MANOVA. Profile analysis. Two-way MANOVA.	5
A selection of the following topics according to class/instructor interest. - Principal components - Factor analysis - Canonical correlation analysis - Discrimination and classification - Clustering, multidimensional scaling	3 5 4
TOTAL HOURS	**36**

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