Linear Models Preliminary Exam Syllabus

Department of Mathematical Sciences
University of Cincinnati

Generalized Inverses, Solutions to Linear Systems, Multivariate random variables, Multivariate Normal Distribution and its properties, Some non-central distributions, Distributions of quadratic forms, Least Squares (LS) Estimation, Estimable functions, Gauss-Markov Theorem, Generalized LS estimation, Estimation with linear restrictions, Properties of LS estimates, General linear Hypotheses, Confidence Intervals and Multiple Comparisons, Maximum Likelihood Estimation, Fixed-Effect Models, Random-Effect Models, Mixed- Effect Models, REML estimation, Repeated Measure Designs, Generalized Linear Model, Inference about mean vector, MANOVA, Multivariate Linear regression Models, Principal Component Analysis, Factor Analysis, Discriminant Analysis.

This material is covered in STAT 7021 and STAT 7022

Suggested Texts:

A First Course in Linear Model Theory (2001) by Ravishanker and Dey
Analysis of Messy Data, Vol 1, 2nd eds, (2009) by Milliken and Johnson
Applied Multivariate Statistical Analysis, 6 eds. By Johnson and Wichern
Linear Models (1971) by Searle
Variance Components, 1st ed. by Searle, Casella and McCulloch