

# Linear Models Preliminary Exam Syllabus

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Generalized inverses, solutions to linear systems, multivariate random variables, the multivariate normal distribution and its properties, some non-central distributions, distributions of quadratic forms, least squares (LS) estimation, estimable functions, the Gauss-Markov theorem, generalized LS estimation, estimation with linear restrictions, properties of LS estimates, the general linear test and its relationship with the likelihood ratio test, power of hypothesis tests in linear models, confidence intervals and multiple comparisons, underfitting and overfitting, model diagnostics, mixed-effect models.

This material is covered in STAT 7024.

Texts:

Ravishanker, *A First Course in Linear Model Theory*.

Searle, *Linear Models*.