

STAT 7140: Linear Models, Fall 2011

Instructor	Dr. L. Wang Office: 332 Machray Hall; Phone: 474-6270 e-mail: liqun_wang@umanitoba.ca
Lectures	Monday/Wednesday: 11:30am - 12:45pm, room 316 Machray Hall
Office hours	Monday/Wednesday: 1:30pm - 2:45pm or by appointment
Marking scheme	The final grade will consist of the following components. There will be two term tests written during the class, tentatively on October 12 and November 9, 2011. Homework questions will be given from time to time in the class. Homework 10% Term tests 40% (20% each) Final exam 50%
References	A. C. Rencher; G. B. Schaalje: <i>Linear Models in Statistics</i> , 2nd ed., Wiley, 2008. K. E. Muller; P. W. Stewart: <i>Linear Model Theory</i> , Wiley, 2006. R. H. Myers; J. S. Milton: <i>A First Course in the Theory of Linear Statistical Models</i> , PWS-KENT, 1991. C. E. McCulloch; S. R. Searle; J. M. Neuhaus: <i>Generalized, Linear, and Mixed Models</i> , 2nd ed., Wiley, 2008.

Course content:

1. Matrix algebra: vector space, generalized inverse, positive and nonnegative definite matrices, eigenvalue and eigenvectors, spectral decomposition, projection.
2. Random vectors: multivariate normal distribution, quadratic forms and their distributions
3. Full-rank models: (generalized) least squares estimation, Gauss-Markov theorem, maximum likelihood estimation, inference.
4. Reduced-rank models: ANOVA models, estimable functions, reparameterization, inference.
5. Mixed models: restricted maximum likelihood estimation, generalized estimating equations, prediction of random effects.
6. Additional topics: linear biased estimators, admissibility, generalized linear models, linear measurement error models.

Academic Dishonesty: I wish to draw your attention to the sections in *The University of Manitoba Undergraduate Calendar* dealing with academic integrity, including plagiarism, cheating and examination impersonation.