STAT 538A - GENERALIZED LINEAR MODELS
2009/2010 - Term 1

Prerequisite: Open to any interested graduate students in the Department of Statistics. Graduate students from other departments are welcome provided they have sufficient statistical and mathematical backgrounds. Such students should consult the instructor about suitability.

Textbook: "Extending the linear model with R: generalized linear, mixed effects, and nonparametric regression models," by Julian Faraway. Chapman and Hall / CRC Press, 2006 (ISBN 1-58488-424-X).

Description: Generalized Linear Models (GLMs) extend much of the `niceness' of linear models to situations where the response variable is not continuous. Consequently these models are popular for analysis in the common scenarios of response variables which are binary, categorical, counts, proportions, or directions. GLMs have become a big part of the `statistical toolbox' in most application areas. This course will be a core introduction to GLMs, including a quick review of linear models, the fundamental formulation of GLMs, discussion of link functions, iterative least-squares algorithms, deviance and asymptotic theory, residuals, quasi-likelihood, and quadratic variance functions. A wide range of GLM applications will be discussed.

Coursework will include a mix of data-analytic and empirical exercises (i.e., using the computer) and more theoretical exercises. Students will develop (or already have) some computing skills with the R software package.

Other References:

An Introduction to Generalized Linear Models, Second Edition, by Annette J. Dobson. Chapman and Hall / CRC Press, 2001 (Freely available to UBC community via library subscription to StatNetBase.)

Generalized Linear Models, Second Edition. McCullagh and Nelder. Chapman and Hall / CRC Press, 1989.

Modern Applied Statistics with S. Venables and Ripley. Springer, 2002.