

BTRY 7180 -- Generalized Linear Models -- FALL 2009

TIME: MW 8:40-9:55am, Comstock B106 ****NOTE THE TIME CHANGE****

INSTRUCTOR: James Booth, Professor
Biological Statistical and Computational Biology
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COURSE DESCRIPTION: This course will focus on the theory and application of linear and generalized linear models and related statistical topics.

Generalized linear models are a very broad family of statistical models, loosely described as follows. The response variable has a distribution in an exponential dispersion family and the mean response is related to covariates through a link function and a linear predictor. GLMs allow a unified theory for many of the models used in statistical practice, including normal theory regression and ANOVA models, loglinear models, logit and probit models for binary data and models for gamma responses and survival data.

Related topics include generalized estimating equations (GEE) and generalized linear mixed models (GLMM) for handling dependent responses.

PREREQUISITE: BTRY 408 and BTRY 409 or equivalent, courses in Linear Algebra and Linear Models, or permission of instructor

GRADING POLICY: Grades will be based on approximately five takehome assignments and an in-class presentation. Homework assignments may involve data analysis and computation requiring students to use a statistical package. In addition, each student will be required to give a presentation on a topic related to the course material but not covered class. I will provide a list of potential topics, but you may also choose your own. Each student's topic must be approved in advance by me.

POINTS: Homework 90, Presentation 10.

OFFICE HOURS: TBA

REFERENCES: Other sources for course material include:

Generalized Linear Models, 2nd Edition, 1989
by Peter McCullagh and John Nelder: Chapman and Hall

Generalized, Linear, and Mixed Models, 2001
by Shayle Searle and Charles McCulloch: John Wiley & Sons

The Theory of Exponential Dispersion Models and Analysis of Deviance
by Bent Jorgensen

Statistical Modelling in GLIM
by M. Aitkin, D. Anderson, B. Francis and J. Hinde:
Oxford Science Publications

Generalized Additive Models
by Trevor Hastie and Robert Tibshirani: Chapman and Hall

Multivariate Statistical Modelling Based on Generalized Linear Models
by Ludwig Fahrmeir and Gerhard Tutz: Springer