

STAT 538A, Generalized Linear Models

Instructor: Gabriela Cohen Freue

Time and Place:

- Tu/Th 3:00-4:30 pm, Oct 26 - Dec 07, 2021,
- ESB 4192

Course 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 the analysis 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. A wide range of GLM applications will be discussed.

Prerequisites: 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, including solid knowledge of linear algebra (vectors, matrices, inverse, eigenvalues/decompositions, positive (semi)definiteness, symmetric matrices), multivariable calculus (gradient, hessian, basic optimization), and undergraduate statistics (basic estimation and inference, linear regression, probability theory). Such students should consult the instructor about suitability. Students are also assumed to have a good computing skill with the R software package.

Coursework: Coursework will include a mix of data-analytic and empirical exercises (i.e., using the computer coding) and more theoretical exercises.

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

Regression Analysis of Count Data, by Cameron and Trivedi. Cambridge, 1998.

An Introduction to Generalized Linear Models, Second Edition, by Annette J. Dobson. Chapman and Hall / CRC Press, 2001

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

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