

STA 7249
Section 7523

Generalized Linear Models

Spring, 2007

Course Information

Time: T 10:40 – 11:30 a.m. (per. 4) **Location:** 230 FLO (Griffin-Floyd Hall)
R 10:40 a.m. – 12:35 p.m. (per. 4–5)

Instructor: Dr. Brett Presnell

Office: 220 FLO

E-mail: presnell@stat.ufl.edu

Office Hours: See instructor's web page.

Phone: 392-1941 Ext. 236

Web Page: <http://www.stat.ufl.edu/~presnell/>

Text: P. McCullagh and J. A. Nelder, *Generalized Linear Models, Second Edition*. Chapman & Hall/CRC, Boca Raton, 1989.

Prerequisites: STA 6327 and STA 6208, or permission of instructor.

Course Content and Objectives

This course will focus on the theory and application of generalized linear models and related statistical topics. Questions on this material appear on the PhD qualifying exam in statistics.

Generalized linear models (GLMs) 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.

The core material for the course is covered in Chapters 2–9 of the course text. Other topics will be covered if time permits.

Grading

There will be two exams, tentatively scheduled for February 20 and April 10. Homework will also be assigned periodically and graded. Homework assignments may involve data analysis and computations requiring the use of a statistical package and/or programming language.

At or near the end of the semester, students will be required to give a presentation on a topic related to the course material but not covered in class. The instructor will provide a list of potential topics and/or papers, but the student may also choose their own. Each student's topic must be approved in advance by the instructor.

Exams will account for 50% of the course grade, homework for 40%, and the presentation for the remaining 10%.

Other References

Besides the course text, other possible sources for course materials include:

AGRESTI, A. (2002). *Categorical Data Analysis*. New York: Wiley, 2nd ed.

DIGGLE, P. J., HEAGERTY, P. J., LIANG, K.-Y. & ZEGER, S. L. (2002). *Analysis of Longitudinal Data*. Oxford: Oxford University Press, 2nd ed.

FAHRMEIR, L. & TUTZ, G. (2001). *Multivariate Statistical Modelling Based on Generalized Linear Models*. New York: Springer-Verlag, 2nd ed.

HASTIE, T. J. & TIBSHIRANI, R. J. (1990). *Generalized Additive Models*. New York: Chapman & Hall.

LEE, Y., NELDER, J. A. & PAWITAN, Y. (2006). *Generalized Linear Models with Random Effects: Unified Analysis via H-likelihood*. Boca Raton: Chapman & Hall/CRC.

MCCULLOCH, C. E. & SEARLE, S. R. (2001). *Generalized, Linear, and Mixed Models*. New York: John Wiley & Sons, Inc.

RUPPERT, D., WAND, M. P. & CARROLL, R. J. (2003). *Semiparametric Regression*. Cambridge University Press.