

Course Information

Time: MWF, 1:55 – 1:45 p.m. (period 7)

Location: 230 FLO (Griffin-Floyd Hall)

Instructor: Dr. Brett Presnell

Office: 220 FLO

E-mail: presnell@stat.ufl.edu

Office Hours: See instructor's web page.

Phone: 273-2989

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

Course Web Page: <http://www.stat.ufl.edu/~presnell/Courses/sta7249-2013sp/>

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

Course Content and Objectives

In a generalized linear model (GLM), 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. This course will focus on the theory and applications of generalized linear models and related statistical topics. Questions on this material appear on the PhD qualifying exam in statistics.

Grading

There will be two exams. The exams are tentatively scheduled as follows:

| Day | Date | Begin | End | Location |
|------|--------|------------|-----------|----------|
| Thur | Feb 28 | 11:45 p.m. | 1:40 p.m. | FLO 230 |
| Thur | Apr 18 | 11:45 p.m. | 1:40 p.m. | FLO 230 |

Homework will also be assigned periodically and graded. Homework assignments may require data analysis and other computations using a statistical package and/or programming language. A final project will also be assigned. The project will require both a written report and an oral presentation. The exams will each account for 35% of the course grade, and homework and the final project will each account for 15%.

Other References

Lectures and notes will draw on material from published papers and various textbooks and monographs. The texts listed below are among those consulted and where possible they have been placed on reserve for this course in the Science Library. At least one of them (Jiang, 2007) is available electronically through the UF Library, as is the older second edition of Agresti (2002). Many of the examples in the course notes were taken from McCullagh & Nelder (1989), the longstanding standard text for the study of GLMs.

AGRESTI, A. (2002). *Categorical Data Analysis*. New York: Wiley, 3rd 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.

JIANG, J. (2007). *Linear and Generalized Linear Mixed Models and Their Applications*. New York: Springer.

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

MADSEN, H. & THYREGOD, P. (2010). *Introduction to General and Generalized Linear Models*. Boca Raton: CRC Press.

MCCULLAGH, P. & NELDER, J. A. (1989). *Generalized Linear Models*. Boca Raton: Chapman & Hall/CRC, 2nd ed.

MCCULLOCH, C. E., SEARLE, S. R. & NEUHAUS, J. M. (2008). *Generalized, Linear, and Mixed Models*. Hoboken, New Jersey: John Wiley & Sons, Inc., 2nd ed.

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