STAT 602
Generalized Linear and Nonlinear Modelling

Spring 2012
Day Course

Instructor: Dr. Joan Hu

Prerequisite:

STAT 302 or STAT 350 or permission of instructor. Open only to graduate students in departments other than Statistics & Actuarial Science.

Textbook (Optional):

An Introduction to Categorical Data Analysis, 2nd ed., by: Alan Agresti; publisher: Wiley.

Calendar Description:

A methods oriented unified approach to a broad array of nonlinear regression modelling methods including classical regression, logistic regression, probit analysis, dilution assay, frequency count analysis, ordinal type responses, and survival data. A project will be assigned related to the student's field of study.

Outline:

This course introduces students to the most important methods for analyzing categorical data. The focus of the course is twofold: classical methods in categorical data analysis, such as chi-squared tests, and generalized linear models with attention primarily directed towards theory and applications involving binary and count response data. The classical methods have long played a prominent role. The theory of generalized linear models has provided a unified framework for regression models and offered great insight into the connections between statistical procedures. It extends beyond the concepts and methods of STAT 350, and targets students who are interested in advanced regression modelling.

1. Introduction and review
2. Two-way contingency table
3. Three-way contingency table
4. Generalized linear model: the exponential family, link function
5. Logistic regression
6. Loglinear regression
7. Further topics, including goodness-of-fit and model selection, over-dispersion and quasi-likelihood, theory of generalized linear regression.

Grading Scheme:

Assignments – 20%
Midterms and Project – 50%
Final – 30%
Grading is subject to change.

Revised October 21, 2011