



# STAT 402

## Generalized Linear and Nonlinear Modelling

Spring 2012  
Day Course

Students requiring accommodations as a result of disability, must contact the Centre for Students with Disabilities 778-782-3112 or csdo@sfu.ca

Instructor: [Dr. Joan Hu](#)

### **Prerequisite:**

STAT 350

### **Textbook (Optional):**

*An Introduction to Categorical Data Analysis*, 2<sup>nd</sup> ed., by: Alan Agresti; publisher: Wiley.

### **Calendar Description:**

A skills oriented unified approach to a broad array of non-linear regression modelling methods including classical regression, logistic regression, probit analysis, dilution assay, frequency count analysis, ordinal-type responses, and survival data.

### **Quantitative.**

### **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 responses. 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%

Midterm – 30%

Final – 50%

*Grading is subject to change.*

*Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester. Students are reminded that Academic Honesty is a cornerstone of the acquisition of knowledge. Scholarly integrity is required of all members of the University. Please consult the General Guidelines of the calendar for more details.*

Revised October 21, 2011