STAT 402
Generalized Linear and Nonlinear Modelling

Spring, 2009
Lectures: MW 10:30-11:20 (AQ4130), F 10:30-11:20 (RCB6136)
Tutorials: M 9:30-10:20 (AQ5039), W 9:30-10:20 (AQ5006)

Instructor: Rachel Altman
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Phone: 778.782.3288
Office hours: M 3:30-4:30,
W 1:30-2:30, or by appointment
Location: SC-K10551

TA: Joslin Goh
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Office hours: T 10:30-12:30
or by appointment
Location: TBA

NOTE: I will also hold office hours M 1:30-2:30 and F 9:15-10:15, but STAT 300 students will have priority during these times.

Course website: http://www.stat.sfu.ca/~raltman/stat402.html

Class notes, data sets, and assignments will be available on-line. It is recommended that you print out the notes before each lecture.

Textbook:

Dobson, A.J. (2008). *An Introduction to Generalized Linear Models, 3nd Ed.* Chapman & Hall: Boca Raton, FL.

Please email me if you find any errors in the book! I will post them on the course website.

Books on hold in the library:

McCullagh, P. and Nelder, J.A. (1989). *Generalized Linear Models, 2nd Ed.* Chapman & Hall: London.

Computing:

You have access to S-PLUS, SAS, Minitab, and other statistical software packages through your SFU account. You are welcome to use any package you'd like to do the data analyses. However, the TA and I will provide support ONLY for S-PLUS.

S-PLUS is available for free from the SFU Microcomputer Store (http://microstore.ucs.sfu.ca/swdownload.html) if you'd like to download it to your home computer. Likewise, the open-source version of S-PLUS, R, is freely available at http://www.r-project.org/

Marking Scheme:

	Worth	(Tentative) Due Dates
Assignment 1	10%	Jan. 22, 2009
Assignment 2	10%	Feb. 5, 2009
Assignment 3	10%	Feb. 16, 2009
Midterm	20%	Mar. 6, 2009 (in class)
Assignment 4	10%	Mar. 19, 2009
Assignment 5	10%	Apr. 2, 2009
Final	*30%	Apr. 17, 2009 (12pm-3pm)

*__NOTE__: You must achieve 50% on the final exam in order to pass the course.

Topics Covered (Time Permitting):

1. Review
    - Linear regression, least-squares
    - Likelihood theory
2. Theory of generalized linear models
    - Maximum likelihood estimation
        - Newton-Raphson method
        - Iteratively reweighted least-squares
    - Model components
        - Exponential family and its properties
        - Link functions
    - Goodness-of-fit
        - Analysis of deviance
        - Pearson statistic
        - Analysis of residuals
    - Model selection
3. Particular models
    - Binary data
    - Categorical data
    - Poisson data
    - Multinomial data
4. Overdispersion and quasi-likelihood
5. Survival analysis

Some Final Notes...

1. This course will be challenging for those students who have not taken STAT 350, linear algebra, and calculus. Be prepared to do substantial background reading if you are one of these students. In particular, if you find the review in the first 4 lectures difficult, this course might not be suitable for you.

2. You are expected to be able to communicate statistical concepts both mathematically and in English. You will be marked on your clarity in both contexts.

3. Please put STAT402 in the subject heading of emails to us. Otherwise, your message may be deleted as spam.

4. For assignments, please submit only computer output that is relevant to the solution. (S-PLUS can provide much more output than you need!)

5. You may discuss assignment problems with your classmates, but work you hand in must be your own.

6. The Code of Academic Honesty (`http://www.sfu.ca/policies/teaching/t10-02.htm`) will be enforced.

7. Please come to office hours or email us (rather than dropping by our offices) if you have questions.

8. We ask your cooperation in easing the TA's workload by avoiding grading disputes involving 1 or 2 marks.

9. In general, late assignments are not accepted except in the case of (documented) illness, family emergency, etc. If you are having problems finishing an assignment, understanding the material before an exam, etc., please contact me well in advance.