

MATHEMATICAL STATISTICS - SEMESTER 2, 2008

Sampling Theory & Categorical Data Analysis - STAT 3014/3914

Weeks 7-13, Categorical Data Analysis.

Lecturer: Dr. M. SHELTON PEIRIS, Carslaw, 819 (Tel. 9351-5764)

Method of Teaching: 2 lectures, 1 tutorial and 1 computer class per week

Lectures: Wednesday 9.00 am (Carslaw 451) and Friday 9.00 am (Carslaw 451)

Tutorial: Thursday 10.00am a.m. (Carslaw 451)

Computer Class: Fri 10.00 am (Carslaw Lab 610)

Course Outline (Approx.):

- Review of two-way tables.
Pearson's χ statistic. Test for independence and homogeneity of proportions. Odds ratios and relative risk.
- Introduction to generalized linear models.
The two parameter exponential family. GLM structure. Canonical links. Deviance.
- Log-linear analysis.
Fitting log-linear models to two-way tables. Pearson residuals. Log-linear models for three way tables. Collapsibility. Simpson's paradox.
- Logistic regression models.
- Other selected topics.
Fisher's Exact Test and McNemar's Test. The Cochran-mantel-Haenszel test and its relationship to McNemar's test.

Reference Books:

- Agresti, A. (1996), *An Introduction to Categorical data Analysis*, Wiley, New York.
- Cox, D. and Snell, E. (1989), *Analysis of Binary Data*, (2nd Ed), Chapman and Hall, London.
- Fienberg, S.E. (1980), *The Analysis of Cross-Classified Data*, MIT Press, Cambridge.
- McCullagh, P. and Nelder, J. (1989), *Generalized Linear Models*, (2nd Ed), Chapman and Hall, London.

CONSULTATION TIME: Thursday 1 - 2 pm (Carslaw 819)