STAT 305-3
Introduction to Biostatistical Methods for Health Sciences

Fall 2013
Day Course
Statistics Workshop

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. Brad McNeney
Lab Instructor: Robin Insley

Prerequisite:
STAT 201 or 203. Students cannot obtain credit for STAT 305 if they already have credit for STAT 302 or 350, or if they are simultaneously enrolled in STAT 305 and either or both of STAT 302 and 350. Statistics major and honors students may not use this course to satisfy the required number of elective units of upper division statistics.

Textbook:
Principles of Biostatistics (2nd ed.) by M. Pagano, K. Gauvreau. Publisher: Brooks/Cole

Calendar Description:
Intermediate statistical techniques for the health sciences. Review of introductory concepts in statistics and probability including hypothesis testing, estimation and confidence intervals for means and proportions. Contingency tables and the analysis of multiple 2x2 tables. Correlation and regression. Multiple regression and model selection. Logistic regression and odds ratios. Basic concepts in survival analysis. **Quantitative.**

Course Outline:

1. Review of introductory statistics: Hypothesis testing, estimation and confidence intervals for means and proportions.
2. Review of basic concepts of probability with applications including diagnostic testing, sensitivity and specificity, the relative risk and the odds ratio.
3. Contingency Tables: The Chi-square test, r x c tables, multiple 2x2 tables, Simpson's paradox, Mantel-Haenszel method.
4. Correlation and simple linear regression: Regression concepts, estimation and testing for regression coefficients, evaluation of the model.
5. Multiple linear regression: Inference for regression coefficients, confounding and interaction, indicator variables, model selection, prediction, model assumptions and checking.
6. Logistic regression: Odds ratios, inference for regression coefficients, model assumptions and checking, case-control studies.
7. Time permitting: Survival analysis including life tables, censoring, Kaplan-Meier method, log-rank test.

Grading Scheme:

Assignments 20%
Midterm 1 - 15%
Midterm 2 - 15%
Final Exam 50%
Grading is subject to change

Examinations:
The midterms and final are closed book examinations. No electronic devices are permitted. Exam questions will be of a general nature and emphasize the interpretation of analysis results rather than complex formula calculations. The students will not be required to memorize formulas and may bring a two-sided sheet (hand-written and not mechanically reproduced) with any information that the student deems important into the exams. This sheet will be handed in with the exam. Any Academic Dishonesty (see below) on midterms and final examinations will be prosecuted and result in an expulsion from this class.

Assignments:
In completing assignments, consultation with other students regarding computer programming methods and difficulties is allowed and encouraged. You should, however, come to your own conclusions, and be prepared to defend them in your own words. Plagiarism is a form of Academic Dishonesty (see below), will be fully prosecuted, and may result in loosing all credit for all assignments. Methods used should be described and shown, and brief computer output should be included with the answer. Some familiarity with the JMP statistical package will be helpful.

Use of cell phone and computers in class.