

PH 242C Course Syllabus

Instructor: Nicholas P. Jewell (jewell@berkeley.ed

GSI: Robin Mejia (mejia@nasw.org)

Lectures: Tu & Th, 11am—12:30pm, 209 Dwinelle (my understanding is that this classroom does not enable webcasting)

Labs (in 340A Haviland): Two labs: W and F, 12-2 pm (perhaps to be combined into one lab on Friday depending on demand)

Office Hours:

Nick: Tues 1-4 pm in 107 Haviland Hall

Robin: TBA

Relevant Texts

No required text. Nicholas P. Jewell and Alan Hubbard are currently writing a book on the subject and drafts of chapters, as well as lectures and some additional readings will be posted on *bCourses*.

Course Description

This course covers the statistical issues surrounding estimation of effects using data on units (e.g., subjects) followed through time. The course emphasizes a regression model approach to time to event, repeated measures of continuous, binary and count data. The primary focus will be on implementation and interpretation of various model analyses, but we will try to provide mathematical intuition behind the procedures when possible. The statistical/mathematical material includes some survival analysis, linear models, logistic and Poisson regression and matrix algebra for statistics. Time permitting, we may discuss some causal inference issues briefly.

Assignments/Exams

We will have approximately six assignments. Most assignments will involve computer analysis of data. Although the student can use any software they find convenient, STATA will be emphasized in the lectures and labs. The final assignment will be a data analysis of the student's choosing, to be presented as a poster session in the last week(s) of the semester—students will probably be asked to self-organize into small groups. Grades are based on 50% assignments, and 50% final project.

List of topics

- Introduction to course, examples of data, notation
- Major Themes of the Course
- Graphical representation of longitudinal data
- Collapsing longitudinal outcome data into a univariate observation: Poisson and Negative Binomial regression.
- Naïve (ordinary least squares) analysis of repeated measures data.
- Repeated longitudinal outcomes (and possibly time-dependent covariates).
- Contrasting different approaches: estimating equation (marginal), transitional and likelihood-based (mixed) models.
- Marginal and transitional estimation.
- Mixed (multilevel, hierarchical) models.
- Contrast of GEE (semi-parametric model - estimating function) and mixed model (likelihood-based) approaches
- Trajectories

Possible (Unlikely) Additional Topics

- Survival analyses.
- Ecological time series.