

Course Title: Biostatistical Methods for Clinical Research III
Course Number: Biostatistics 209
Spring 2009

A. Objectives

This is a third course in a statistics sequence, covering multi-predictor regression methods in survival and repeated measures outcome data. Emphasis is on the practical and proper use of statistical methodology and its interpretation. The statistics package STATA will be used throughout the course.

At the end of the course, students will be able to:

- Undertake a data analysis with repeated measures outcome data
- Conduct a Cox proportional hazards analysis for survival data
- Perform and write up the results of a data analysis for class discussion

B. Prerequisites

Designing Clinical Research (Epi 202), Biostatistical Methods II (Biostat 208), and possession of a M.D., Ph.D., D.D.S. or Pharm.D. or equivalent doctoral degree. Exceptions to these prerequisites may be made with the consent of Dr. Cheng, space permitting.

C. Faculty

Course	Su-Chun Cheng, Sc.D.
Director:	Phone: 415-514-8028 Email: scheng@biostat.ucsf.edu
Lecturers:	Peter Bacchetti, Ph.D. Email: peter@biostat.ucsf.edu
	Su-Chun Cheng, Sc.D.
	Chuck McCulloch, Ph.D. Email: chuck@biostat.ucsf.edu
TA:	Kirsten Kangelaris, M.D. Phone: 415-502-7105 Email: kkangelaris@medicine.ucsf.edu

D. Format

1. **Lectures:** Tuesdays (Through 5/12/09) & 4/23 10:30 to 12:00, CBL 6702
2. **Labs:** Thursdays (Through 5/14/09) 10:30 to 12:00, CBL 6704
3. **Homework Reviews:** Tuesdays 4/14 & 4/21 12:00 to 1:00, CBL 6702
4. **Data Analysis Presentations:** Weeks of May 26 and June 2, 2009

E. Textbook

Regression Methods in Biostatistics by Vittinghoff, Glidden, McCulloch and Shiboski.

F. Grading

Grades will be based on 4 homework assignments (70%) and a data analysis project (30%, due on 5/22/09).
Late work is not accepted.

G. Syllabus (for updates, please see <http://www.epibiostat.ucsf.edu/courses/schedule/biostatiii.html>)

Date/Time	Faculty	Title/Content	Reading & Assignment
3/31	Cheng	Survival Data <i>Survival data, hazards functions, hazard ratios basics of the Cox model</i>	Chapters 7.1-7.2.3, VGSM Assignment: Homework #1 Due Date: 04/14/09
4/7	Cheng	The Cox Model <i>Cox model with binary, categorical and continuous predictors; confounding, mediation and interaction; adjusted survival curves</i>	Chapters 7.2.4-7.2.10 VGSM Assignment: Homework #2 Due Date: 04/21/09
4/14	Cheng	Extensions and Diagnostic for the Cox Model <i>Time dependent covariates; stratified Cox model; model checking for the Cox model</i>	Chapters 7.3-7.5, VGSM
4/21	Bacchetti	Issues in Data Analysis <i>Misinterpretation of p-values; estimates and confidence intervals; accuracy versus conservatism</i>	1 or 2 journal articles, TBA Will be discussed 4/23/09
4/23	Bacchetti	Issues in Data Analysis <i>Discussion of readings; checking assumptions presenting methods and results clearly</i>	
4/28	McCulloch	Repeated Measures Data <i>Introduction to repeated measures data; correlation structures</i>	Chapters 8.1-8.3, VGSM Assignment: Homework #3 Due Date: 05/12/09
5/5	McCulloch	Repeated Measures Data <i>Fixed and random factors; prediction; Stata's XTMIXED and XTGEE</i>	Chapters 8.4, 8.6, VGSM Assignment: Homework #4 Due Date: 05/19/09
5/12	McCulloch	Repeated Measures Data <i>Generalized linear models; non-normal outcomes; robust standard errors; use of nonlinear link functions</i>	Chapter 8.5, VGSM
5/26-6/5	Various	Project Presentations	