

Course Title: Biostatistical Methods for Clinical Research III
Course Number: Biostatistics 209
Spring 2021

A. Objectives

This is the 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:

- Conduct a Cox proportional hazards analysis for survival data
- Undertake a data analysis with repeated measures outcome 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. Huang, space permitting.

C. Faculty

Course	Chiung-Yu Huang, Ph.D.
Director:	Email: ChiungYu.Huang@ucsf.edu
Lecturer:	Chuck McCulloch, Ph.D. Email: Charles.McCulloch@ucsf.edu
TA:	Janet Chu Email: Janet.Chu@ucsf.edu
TA:	Caitlin Turner Email: Caitlin.Turner@ucsf.edu

D. Format

All lectures will be prerecorded and posted online before the regular hours (to avoid possible technical issues). Live Zoom-mediated sessions will be held for mini-reviews and discussions every Tuesday 10.30-12.00 *EXCEPT*** additional session on Thursday 4/22/21. Labs and Homework Reviews will be conducted as live Zoom sessions. Lab quizzes are due before 5PM after each lab session.**

1. Lectures:	Prerecorded	
2. Live Zoom-Mediated Sessions	Tuesdays (Through 5/11/21) & 4/22	10:30 to 12:00
3. Labs and Homework Reviews:	Thursdays (Through 5/13/21) except for 4/22	10:30 to 12:30
4. Projects Due:	5/20/21 by 5pm	
5. Data Analysis Presentations:	May 25, May 27, June 1, and June 3, 2021	10:00 to 1:00

Instruction for joining the online sessions are given below:

Chiung-Yu Huang Live Zoom Session (Mar. 30 - Apr. 22):

<https://ucsf.zoom.us/j/93384439101> or +1 669 900 6833

(Meeting ID: 933 8443 9101) (Password: 144391)

Chuck McCulloch Live Zoom Session (Apr. 27 - May. 13):

<https://ucsf.zoom.us/j/2824874042> or +1 669 900 6833

(Meeting ID: 282 487 4042) (Password: 271828)

E. Textbook

Regression Methods in Biostatistics by Vittinghoff, Glidden, Shiboski and McCulloch. **2nd Edition.**

F. Grading

Grades will be based on **5** homework assignments (65%), **6** lab quizzes (**5%**, due at 5PM after each lab session), and a data analysis project (30%, due on 5/20/21).

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
			Useful to review Chapter 3.5 in advance

3/30/21	Huang	Survival Data <i>Survival data, hazards functions, hazard ratios, basics of the Cox model</i>	Chapters 6.1-6.2.4, VGSM Assignment: Homework #S1 Due: 04/13/21 by 10.30 am
4/6/21	Huang	Survival Data <i>Cox model with binary, categorical and continuous predictors; confounding, mediation and interaction; adjusted survival curves</i>	Chapters 6.2.5-6.2.13 VGSM Assignment: Homework #S2 Due: 04/20/21 by 10.30 am
4/13/21	Huang	Survival Data Extensions and Diagnostics for the Cox Model: <i>time dependent covariates; stratified Cox model; model checking for the Cox model</i>	Chapters 6.3-6.5, VGSM
4/20/21	Huang	Common Biostatistical Problems <i>Misinterpretation of p-values; estimates and confidence intervals.</i>	1 or 2 journal articles, TBA Assignment: Homework #C1 Due by and will be discussed 10.30 am 4/22/21
4/22/21	Huang	Common Biostatistical Problems and Competing Risks Survival Analysis <i>Discussion of readings. Competing risks and Fine-Gray modeling</i>	
4/27/21	McCulloch	Repeated Measures Data <i>Introduction to repeated measures data; correlation structures</i>	Chapter 7.1-7.3, VGSM Assignment: Homework #R1 Due: 05/11/21 by 10.30 am
5/4/21	McCulloch	Repeated Measures Data <i>Fixed and random factors; prediction; Stata's XTMIXED and XTGEE, model checking</i>	Chapter 7.4-7.6, VGSM Assignment: Homework #R2 Due: 05/18/21 by 10.30 am
5/11/21	McCulloch	Repeated Measures Data <i>Generalized linear models; non-normal outcomes; robust standard errors; use of nonlinear link functions</i>	Chapter 7.7-7.9, VGSM
5/25-6/3/21	Various	Project Presentations	