

Course Title: Biostatistical Methods for Clinical Research III
Course Number: Biostatistics 209
Spring 2018

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. Kornak, space permitting.

C. Faculty

Course	Chiung-Yu Huang, Ph.D.
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D. Format

1. **Lectures:** Tuesdays (Through 5/15/18) & 4/26 10:30 to 12:00, MH 1400
2. **Labs:** Thursdays (Through 5/17/18) 10:30 to 12:30, MH 1400
3. **Homework Reviews:** 4/17/18 & 4/24/18 12:00 to 1:00, MH 1400
4. **Projects Due:** 5/24/18 by 5pm
5. **Data Analysis Presentations:** May 29, May 31, June 5, and June 7, 2018

E. Textbook

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

F. Grading

Grades will be based on 5 homework assignments (70%) and a data analysis project (30%, due on 5/24/18).

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
4/3/18	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: 04/17/18 by 10.30 am
4/10/18	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: 04/24/18 by 10.30 am
4/17/18	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
4/24/18	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 4/26/18
4/26/18	Huang	Common Biostatistical Problems and Competing	

Risks Survival Analysis

Discussion of readings. Competing risks and Fine-Gray modeling

5/1/18	McCulloch	Repeated Measures Data <i>Introduction to repeated measures data; correlation structures</i>	Chapter 7.1-7.3, VGSM Assignment: Homework #R1 Due: 05/15/18 by 10.30 am
5/8/18	McCulloch	Repeated Measures Data <i>Fixed and random factors; prediction; Stata's <code>XTMIXED</code> and <code>XTGEE</code>, model checking</i>	Chapter 7.4-7.6, VGSM Assignment: Homework #R2 Due: 05/22/18 by 10.30 am
5/15/18	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
5/29-6/7	Various	Project Presentations	