

Course Title: Biostatistical Methods for Clinical Research II
Course Number: Biostatistics 208
Winter 2010

A. Objectives

This is a second course in statistics, covering multi-predictor methods, including linear and logistic multiple regression. Emphasis is 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:

- To identify the major types of data;
- To apply and interpret regression models to address confounding, mediation and interaction;
- To specify and select a set of variables suitable to answer clinically relevant questions;
- To perform basic model assessment for evidence of lack of fit.

B. Prerequisites

Designing Clinical Research (Epi 180.04), Biostatistics 183 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. Shiboski, space permitting.

C. Faculty

Course Director:	Steve Shiboski, Ph.D. Phone: 415-514-8032 email: steve@biostat.ucsf.edu
Lecturers:	Eric Vittinghoff, Ph.D. Phone: 415-514-8025 email: eric@biostat.ucsf.edu
TA:	Jennifer Gibbs, D.D.S., Ph.D. Phone: 415-476-5937 email: jennifer.gibbs@ucsf.edu

D. Format

1. **Lectures:** Tuesdays 10:30 to 12:00, CBL 6702
2. **Labs:** Thursdays 10:30 to 12:30, CBL 6704
3. **HW Review:** Tuesday 12-1pm, CBL 6702: (Dates: 1/26/10, 2/9/10, 2/23/10, 3/9/10)

E. Textbook

Linear, Logistic, Survival, and Repeated Measures Models by Vittinghoff, Glidden, Shiboski and McCulloch, Springer 2005. ISBN #0387202757. Available at the UCSF Campus Bookstore.

F. Grading

Grades will be based on 5 homework assignments (70%) and a final exam (30%). Homework is due prior to class to Olivia DeLeon. The final exam will be distributed on 3/9/10 and due on 3/19/10. Late work is not accepted.

G. Syllabus

Date/Time	Faculty	Title/Content	Reading & Assignment
1/5/10	Shiboski	Introduction and Exploratory Analysis <i>Class organization; importance of data exploration; regression overview</i>	Chapters 1-2, VGSM Assignment: Homework #1 Due Date: 01/26/10
1/12/10	Shiboski	Multiple Linear Regression <i>Regression with a single binary or continuous Predictor; Multiple regression</i>	Chapter 3.2-3.3, VGSM Chapter 4.1-4.2, VGSM
1/19/10	Shiboski	Categorical Predictors <i>Ordinal and nominal predictors; tests for trend</i>	Chapter 4.3, VGSM
1/26 /10	Vittinghoff	Confounding and Mediation <i>Confounding mediation and adjustment</i>	Chapter 4.4-4.5, VGSM
2/2/10	Vittinghoff	Interaction Conceptual introduction, product terms, testing for interactions, lincom statements;	Chapter 4.6, VGSM Assignment: Homework #2 Due Date: 02/9/10
2/9/10	Vittinghoff	Model Diagnostics Linearity, normality, constant variance; influential points	Chapter 4.7, VGSM
2/16/10	Vittinghoff	Predictor Selection Causal diagrams, three inferential goals; number of predictors, colinearity	Chapter 5, VGSM Assignment: Homework #3 Due Date: 02/23/10
2/23/10	Shiboski	Binary Outcome Data <i>Contingency tables; binary outcomes; measures of association; logistic model</i>	Chapter 3.4, VGSM Chapter 6.1, VGSM Assignment: Homework #4 Due Date: 03/9/10
3/2/10	Shiboski	Multiple Logistic Regression <i>Multiple logistic regression; confounding; interaction</i>	Chapter 6.2.1-6.2.3, VGSM
3/9/10	Shiboski	Prediction and Model Diagnostics <i>Prediction; model assessment; outliers; goodness of fit</i>	Chapter 6.2.4-6.2.5 & Chapter 6.4, VGSM Assignment: Final Exam Due Date: 03/19/10
3/16/10	Shiboski	Case Control Studies <i>Case-control study; conditional logistic regression; generalized linear models</i>	Chapter 6.3 & 6.5 VGSM