

APSTA-GE 2996-002, GPH-GU 2196-002
Biostatistics II, Spring 2014

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Class Meeting Time/Room: Mondays, 4:55-6:35, Silver 414

COURSE OVERVIEW: This course sequence is intended for graduate students in epidemiology, public health, and clinical research fields, and is the second in the Biostatistics sequence. It will concentrate on more advanced methods of statistical analysis and research design that are used in biological and medical applications of statistics. It is assumed that the student will be familiar with statistical techniques as presented in Biostatistics I (RESCH-GE2995/GPH-GU-2195). The program SPSS will be used to perform analyses and processing. It is assumed that the student has basic skills in the use of SPSS for entering data sets and performing basic analyses and graphics.

TEXTBOOKS Weekly readings from texts and articles will be posted.
Required text: Intuitive Biostatistics (Moltulksy)
Optional text: Statistics for Research (Dowdy)

OTHER NEEDS

Software: The statistical software package SPSS will be used intensively in this course. It is highly recommended that you obtain a copy at NYU computer store. You can also access SPSS in most NYU computer labs as well as via the virtual lab at <https://vcl.nyu.edu/vpn/index.html>

Calculator: A basic scientific calculator is needed.

iClicker: iClicker will be used as a tool for interactive teaching. A satisfactory iClicker record (90% participation or higher) is required for you to receive a full participation grade. It is your responsibility to bring the iClicker to class.

COURSE REQUIREMENTS

Readings: A list of readings is found at the end of this syllabus. All readings are required unless listed as optional. Required readings come from the “Intuitive Biostatistics” book or are in the form of articles that are posted on the NYU Classes website. Students should read listed chapters prior to that week’s class.

Homework: Problem sets will be assigned during the course. A typical homework involves understanding statistical concepts, using SPSS to analyze data, and interpreting the results, with minimal manual calculation. Homework assignments are automatically administrated through NYUClasses. Each assignment will be available online for approximately a week. You will need to complete the assignment online and will receive instant feedback upon completion. **The homework will become unavailable after its due time. This means it is not possible to turn in late homework.**

Project: There is one project this term, which will focus on both techniques for continuous outcomes (multiple regression, ANOVA) and binary/discrete outcomes (contingency tables, logistic regression). Required analyses for the project will be presented in the form of the results section of a scientific paper. All projects must be typed. All work is to be conducted independently. Plagiarism will result in a grade of 0.

Exams: There will be a midterm and final exam. Each will contain both general statistical knowledge and analysis questions relating to theory, assumptions, procedures, and interpretation. They do not emphasize formulas.

Grades

Weekly Homework:	10%
Project:	25%
Midterm:	25%
Cumulative Final:	30%
Participation:	10%

Weekly Schedule

Note: schedule is tentative and subject to change. All readings are suggested

- Week 1 (1/27): Overview
- Week 2 (02/3): Correlation and Simple Linear Regression
- Week 3 (2/10): Theory and Diagnostics
- Week 4 (2/17): President's Day (**NO CLASS**)
- Week 5 (2/24): Polynomial Regression, Dummy Variables
- Week 6 (03/3): Multiple Regression 1
- Week 7 (3/10): Multiple Regression 2
- Week 8 (3/17): Spring Recess (**NO CLASS**)
- Week 9 (3/24): Midterm Exam
- Week 10 (3/31): Contingency Tables
- Week 11 (04/7): Categorical Data Analysis
- Week 12 (4/14): Logistic Regression
- Week 13 (4/21): Advanced Regression Models
- Week 14 (4/28): Survival Analysis
- Week 15 (05/5): Cox Regression and Proportional Hazards (**Project Due**)
- Week 16 (5/12): Review
- Week 17 (5/19): Final Exam

Readings

Note: not all weeks have readings. All readings are required unless listed as optional. Students should read listed chapters prior to that week's class.

Week 1: Overview

Altman & Bland: Absence of evidence is not evidence of absence
Research Design and the Logic of Control
Motulsky: chapter 44

Week 2: Correlation and simple regression

Fields, Andy: Simple Regression
Bland & Altman: Regression towards the mean
Motulsky: chapters 32, 33, 34
Optional: Dowdy 9.1-9.4

Week 5: Polynomial regression, dummy variables

Optional: Dowdy 14.7

Week 6&7: Multiple Regression

Reference guide on multiple regression
Multiple regression in SPSS
Motulsky: chapters 35, 37, 38
Optional: Dowdy 14.1-14.6

Week 10: Contingency Tables

Odds ratio
Motulsky: chapter 26
Optional:

Week 11: Categorical Data Analysis

Week 12: Logistic Regression

Pampel, Logistic Regression
Motulsky: chapter 36, 37
Optional: Dowdy, 14.8

Week 14: Survival Analysis

Week 15: Cox Regression and Proportional Hazards