

Syllabus for Biostatistics I

Course Information

The class meets every Tuesday 4:55-7:35pm at Silver 714. It is divided into two parts: lecture + lab/interactive session. We will use **Blackboard** as an online platform for posting course materials and assignments. It is your responsibility to check the Blackboard site for any course updates and assignments.

Personnel

Instructors: Ying Lu (ying.lu@nyu.edu)
Anthony Donoghue (anthonycdonoghue@gmail.com)

Teaching Assistant: Amy Shui (ashui@nyu.edu)

Office Hours: To be announced on the course Blackboard site

Textbooks

Required text: *Seeing Through Statistics*, 3rd Edition, Jessica Utts. (Available at NYU book store or amazon.com)

Optional Texts: *Seeing Statistics*, a free online text at <http://www.seeingstatistics.com>. Gary McClelland. (Note this is a different book from the required text)
Biostatistics: the Bare Essentials, 3rd Edition, Norman & Streiner (Including student version SPSS for one year use)

Optional SPSS References:

Data Analysis for the Behavioral Sciences using SPSS, Weinberg&Abramowitz.
SPSS for Windows Step-by-Step: A simple guide and reference, George&Mallery.
Discovering Statistics Using SPSS, 3rd Edition, Field.

Other Essentials

Software: The statistical software package SPSS (preferred version: PASW 19) will be used intensively in this course. It is highly recommended that you obtain a copy at NYU computer store. The student version costs \$85 and it is valid for one year use. You can also access SPSS in most NYU computer labs.

Calculator: You will need a basic scientific calculator. For examples, "Texas Instruments TI30XA" and "Sharp EL531 WB" (available at NYU bookstore).

iClicker: iClicker will be used as a tool for interactive teaching. You can buy a student iClicker at NYU bookstore (\$39). Students' class participation will be recorded through iClicker and counted toward your final grade. A satisfactory iClicker record (90% participation or higher) is required for you to receive full participation grade. It is your responsibility to bring the iClicker to class.

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Course Description

This course is cross-listed under RESCH-GE-2995 and GPH-GU-2995. The course sequence is intended for graduate students in public health and the epidemiology. The course provides both the foundations necessary for Biostatistics II and serves as a stand-alone introductory statistics course. It will concentrate on the interpretation and comprehension of graphical and statistical techniques that are important components of scientific literature. Mathematical ability at the level of high school algebra is required. Data analysis using SPSS is also an important component of the class. There will be SPSS lab sessions covering the topics of data management and statistical analysis.

Objectives: At the conclusion of this course the student will be able to:

- 1) Apply critical evaluation skills to the reading of scientific research presentations as they relate to: sample statistics, simple hypothesis tests, mean comparison and ANOVA.
- 2) Understand the principle of the use of probability theory as a basis for making statistical decisions.
- 3) Perform statistical analyses covered in class using the SPSS statistics program.
- 4) Combine their knowledge of statistical analysis and use of SPSS to perform an analysis of real data to answer scientific hypotheses.
- 5) Undertake further study of statistics based on the Biostatistics II course.

Course requirements:

Homework: Ten homework sets will be assigned during the course. A typical homework involves understanding of the statistical concepts, using SPSS to analyze data and interpreting the results, with only minimal manual calculation. Homework assignments are *automatically* administrated through Blackboard. 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.**

Projects: Two projects will be assigned during the course. Both projects consist of the analysis of a public health or a biologically-oriented data set. The projects are to be typed (word processed) and should be professional in appearance. Hand written projects will not be graded. The project is to be worked on and written up **independently**. Plagiarism will result a grade of 0. By plagiarism we mean either using all or any part of other students' work as your own or allowing others to use all or any part of your own work.

Exams: There will be both a midterm and final exam. Each will contain both general statistical knowledge questions and a series of statistical analyses with questions relating to the theory used, assumptions made and interpretation of the statistical data presented. They do NOT emphasize calculations and formulas. Material from both the lectures and from the text may appear on the exam and all exams are cumulative.

Grades distribution:

Weekly Homework	10%
Projects (2)	30% (15% each)
Midterm	20%
Cumulative Final	30%
Participation	10% (administered through iClicker)

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COURSE SCHEDULE*

Week 1(09/06)	Overview
Week 2(09/13)	Describing the central tendency of a variable
Week 3(09/20)	Describing the dispersion of a variable
Week 4(09/27)	Describing the relationship between two variables
Week 5(10/04)	Understanding probability
Week 6(10/11)	Fall break (no class)
Week 7(10/18)	Midterm 50 minutes
Week 8(10/25)	Normal curves and standardized scores
Week 9(11/01)	Diversity of samples from the same population
Week 10(11/08)	Reasoning with uncertainty—hypothesis testing
Week 11(11/15)	Inference about a single sample mean
Week 12(11/22)	Inference about the difference between means of two groups
Week 13(11/29)	Mean comparison of more than two groups (One-way ANOVA)
Week 14(12/06)	TBD
Week 15(12/13)	Review
Week 16(12/20)	Final Exam 75 minutes

*The course schedule is tentative and subject to revisions during the course.