RUTGERS
School of Public Health

Course Title: Introduction to Biostatistics

Course Number: PHCO 0504J-031

Course Location: Room 1A&1B, School of Public Health Building, Piscataway

Course Date & Time: Wednesday 2:00 pm-5:00 pm

Course Instructor: Wei Wang, MS, PhD student at the Rutgers School of Public Health, Email: ww249@sph.rutgers.edu

Office Hours: By Appointment Only

Course Assistant: N/A

Course Reference: Biostatistics: A foundation for Analysis in the Health Sciences, 10th Edition. Wayne W. Daniel, Wiley, 2013

Required Software: SPSS

- Free access in the SPH computer lab
- To install and use it on your own computer, you have the following options:
    - Purchasing license via software.rutgers.edu ($100, expires on 6/30/2017)
    - Purchasing Student GradPack (the Base GradPack is sufficient for this class) having 6-month license for up to 2 computers via http://www-03.ibm.com/software/products/en/spss-stats-gradpack ($35.95)

Required: Standard calculators (no internet connectivity) will be required for the exams. (Cell phones are not allowed!)

Course Description: An introduction to biostatistical concepts and methods commonly encountered by public health professionals. Students are also expected to complete computer-based exercises for this course.

Competencies Addressed: The competencies addressed in this course include:

- Describe the roles biostatistics serves in the discipline of public health;
- Distinguish among the different measurement scales and the implications for selection of statistical methods to be used based on these distinctions;
- Apply descriptive techniques commonly used to summarize public health data;
- Describe basic concepts of probability, random variation and commonly used statistical probability distributions;
- Apply common statistical methods for inference;
- Describe the preferred methodological alternatives to commonly used statistical methods when assumptions are not met;

- Apply descriptive and inferential methodologies according to the type of study design for answering a particular research question;
- Interpret results of statistical analyses found in public health studies;
- Develop written presentations based on statistical analysis for both public health professionals and educated lay audiences;
- Use statistical software to manage data and perform analyses; and
- Understand the appropriate study designs for answering particular research questions, taking into account population's characteristics.

Course Objectives: By the completion of this course, students will be able to:

- Distinguish among the basic types of data;
- Describe the normal curve and its major characteristics in relation to parametric statistics;
- Calculate descriptive statistics such as mean, median, variance and standard error;
- Describe the relationship of statistics to hypothesis testing;
- Describe the nature of and trade-off between type I and type II errors;
- Perform basic sample size calculations;
- Apply basic statistical test procedures including t-tests, chi-square, non-parametric tests, and calculate correlation;
- Understand the concepts and applications of linear regression and logistic regression
- Decide which parametric or non-parametric test to apply to test a statistical hypothesis;
- Apply statistical software programs to solve common public health problems; and
- Critically review and comprehend basic statistical discussions in the public health literature.

Course Requirements and Grading:

- Your grade will be determined according to the following components
    - Quizzes: 10%
    - Homework/Class Activities: 30%
    - Midterm: 30%
    - Final: 30%

    - *The lowest single homework grade will be dropped.*
    - *Standard non-web-based calculators will be required for the exams.*
    - *Attendance is required.*

- Homework policies
    - Homework assignments will be posted the day following class. This allows me to tailor the homework to cover only the material completed in the class.
    - All written homework must be turned in *at the beginning* of the class period on the day on which they are due. ***No late homework will be accepted.***

- On all homework assignments/problem sets, students are *encouraged* to discuss with one another, but work should be carried out and written up independently. If any two identical write-ups are found, both homework assignments will be given a grade of zero.
- The homework assignments will frequently involve computer work using SPSS. Relevant portions (only) of the output should be cut and pasted into the homework assignment at the appropriate spot, not attached at the end. Failure to comply will result in a reduction of 50% of points for that homework.
- Homework solutions will be posted.

- Students are responsible to get access to the Rutgers Moodle Learning System. For questions, please contact Rutgers Technology Service Center at 732-743-3200.

- Lecture notes (other than first day) will be posted in Moodle the day before each lecture.

- Course Grade Assignment:

Letter Grade	Total Score (Percentage)
A	93.00-100.00
A-	90.00-92.99
B+	87.00-89.99
B	83.00-86.99
B-	80.00-82.99
C+	75.00-79.99
C	65.00-74.99
F	<65.00

Course Schedule:

Lecture	**Date**	**Topic**
1	Sep 7	Introduction and Basic Statistical Concepts
2	Sep 14	Descriptive Statistics
3	Sep 21	Basic Probability
4	Sep 28	Probability Distribution
5	Oct 5	***Midterm I* (Lecture 1~4)** and Sampling Distribution and Confidence Interval
6	Oct 12	Parametric Hypothesis Testing
7	Oct 19	Nonparametric Hypothesis Testing
8	Oct 26	Analysis of Frequencies and Chi-Square Test
9	Nov 2	***Midterm II* (Lecture 5~8)** and Correlation
10	Nov 9	Simple Linear Regression
11	Nov 16	Analysis of Variance
	Nov 23	No Class (Friday Classes Meet)
12	Nov 30	Logistic Regression
13	Dec 7	Review
14	Dec 14	***Final***

School of Public Health Honor Code: The School of Public Health Honor Code is found in the student bulletin (sph.rutgers.edu/academics/catalog/index.html). Each student bears a fundamental responsibility for maintaining academic integrity and intellectual honesty in his or her graduate work. For example, all students are expected to observe the generally accepted principles of scholarly work, to submit their own rather than another's work, to refrain from falsifying data, and to refrain from receiving and/or giving aid on examinations or other assigned work requiring independent effort. In submitting written material, the writer takes full responsibility for the work as a whole and implies that, except as properly noted by use of quotation marks, footnotes, etc., both the ideas and the works used are his or her own. In addition to maintaining personal academic integrity, each student is expected to contribute to the academic integrity of the school community by not facilitating inappropriate use of her/his own work by others and by reporting acts of academic dishonesty by others to an appropriate school authority. It should be clearly understood that plagiarism, cheating, or other forms of academic dishonesty will not be tolerated and can lead to sanctions up to and including separation from the Rutgers School of Public Health.

Policy Concerning Use of Recording Devices and Other Electronic Communications Systems: When personally owned communication/recording devices are used by students to record lectures and/or classroom lessons, such use must be authorized by the faculty member or instructor who must give either oral or written permission prior to the start of the semester and identify restrictions, if any, on the use of mobile communications or recording devices.