

Course Title: Introduction to Biostatistics

Course Number: PHCO 0504

Course Location: Piscataway, New Jersey, New Brunswick campus

Course Date & Time: Thursday evenings, 6:10 – 9:00 pm, Fall semester 2014

Course Instructor: Dirk F Moore, PhD, Dept. of Biostatistics; Dirk.Moore@rutgers.edu

Office Hours: Thursdays 3:30 – 5:30

Course Assistant: Tao Sheng, ts657@sph.rutgers.edu. Office hours: 3:30 – 5:30 Thursdays

Required Text: *Biostatistics: A Foundation for Analysis in the Health Sciences, 10th Edition.* Wayne W. Daniel, Wiley, 2013. ISBN 978-0-470-10582-5

Statistical software: SPSS (available in the SPH computer lab)

Course Description: At the conclusion 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 the mean, median, variance, and standard error; describe the relationship of statistics to hypothesis testing; understand the nature of Type I and Type II errors; explain the concept of statistical power and how it can be calculated; apply basic statistical test procedures including t-tests, chi-square, non-parametric tests, and correlation; decide which parametric or non-parametric test to apply to test a statistical hypothesis; understand the concepts and applications of linear regression; apply statistical software programs to solve common public health problems; and critically review and comprehend basic statistical discussions in the public health literature.

Selected Department Competencies Addressed: The competencies addressed in this course for the include:

- Understanding 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
- Use of a statistical package to organize, analyze, and report collected data
- Application of basic probability theory and standard statistical methods to biomedical research
- Application of descriptive and inferential methodologies according to the type of study design for answering a particular research question
- Review and critique of statistical methods presented in published research studies
- Communication of the results of statistical studies to investigators

Please visit the Department webpages on the School of Public Health's website at <http://sph.rutgers.edu/> for additional competencies addressed by this course for other degrees and departments.

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

- Distinguish among the basic types of data
- Calculate descriptive statistics such as the mean, median, variance, and standard error
- Understand probability concepts including independence, mean, and variance
- Understand and apply the normal, binomial, and Poisson distributions to solve probability problems, and distinguish between continuous and discrete distributions
- Describe the relationship of statistics to hypothesis testing; understand the nature of Type I and Type II errors
- Explain the concept of statistical power and how it can be calculated
- Apply basic statistical test procedures including t-tests, chi-square, non-parametric tests, and correlation
- Decide which statistical test to apply to test a statistical hypothesis
- Apply statistical software programs to solve common public health problems
- Critically review and comprehend basic statistical discussions in the public health literature.

Course Requirements and Grading: *In this section, Instructor should include*

- Homework will be assigned weekly, and all homework assignments will be due the following week. Homework should be neat, clear, and easily readable. Late homework (without prior instructor approval) will not be accepted. Most classes will begin with a brief quiz reviewing material from the previous lecture. Exams will consist mainly of problems to be solved; written solutions should clearly show how the problem is solved as well as presenting a final answer.
- **Grading:** Midterm exam, 30%, Final exam, 40%, Homework, 20%, Quizzes 10%.

Course Schedule: *Include week by week listing of each class session:*

Thursday September 4 – First class

Thursday October 9? – Last day to withdraw with W grade

Tuesday November 25 – Class meets (all “Thursday” classes meet this day)

Thursday November 27 – Thanksgiving day, no class

Thursday December 11 – Final Exam

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.