Biostatistics, Bioinformatics and Study Design

Course Leader
Martin Lesser, PhD

Academic Schedule
This is a one-semester course, held every 3 years in the late winter/spring semester (2015, 2018, etc); meets weekly for 2 hrs per week.

Prerequisites
The course will be taught at a rigorous graduate level. Comfort with mathematical concepts and notation is required. A course in calculus or pre-calculus would be helpful.

Overall purpose/objective
This course will provide an introduction to biostatistical methods commonly used in biomedical and public health sciences. Students will learn how to conduct descriptive and univariable analyses of data from public health and clinical studies and interpret the results of these analyses. The course will cover the basic concepts of statistical inference, including estimation and hypothesis testing. Topics include: principles of probability and probability distributions, with emphasis on the binomial and normal distributions; estimation and comparisons for continuous, categorical, and ordinal data; simple linear regression and correlation; analysis of variance; overview of advanced methods (analysis of covariance, survival analysis, multiple regression, logistic regression), time permitting. In addition, the course will focus on some advanced concepts and skills necessary to plan, conduct, evaluate, and analyze quantitative research within biomedical research-related fields.

Conduct of the course
This course consists of a combination of didactic lectures, group discussions and problem-solving sessions.

Upon completion of the course, students will be able to:
Design biomedical research studies appropriately
Apply standard biostatistics methods to biomedical and public health research problems.
Demonstrate the ability to interpret the results of a statistical analysis and communicate such interpretations in an easily comprehensible manner.
Assess the appropriate use of statistics in published papers

Assessment
Attendance of course lectures is mandatory. Excused absences must be approved in advance.
Formative: Throughout the course, students will be assessed on attendance and participation, and a mid-term exam will be given.

Summative: A final exam will be given.

Final grades will be comprised of attendance (10%), mid-term (40%) and final exam (50%). A minimum score of 80% is required to pass the course.

Readings