BIOSTAT 600

Introduction to Biostatistics

Fall 2013 Syllabus

Instructors: Brisa N Sánchez, Ph.D; M4064 SPH II, brisa@umich.edu
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Website: CTools; Some notes will be posted; others will only be distributed in class.

Description: This is a one-credit course targeted at incoming students in the Department of Biostatistics. The goals are to provide an overview of important concepts pertinent to the design and analysis of biostatistical investigations; to provide a common starting point for students entering the program (presumably with a variety of backgrounds in statistics); provide a review of basic statistics; kindle imagination for data analysis through various examples from the biomedical literature; and to provide a broad introduction to SAS programming.

Topics:
- Role of biostatistics in public health
- Target population; use of sampling
- Univariate (descriptive) analysis
- Graphical displays of univariate statistics
- Rules of probability
- Normal distribution
- Binomial distribution
- Poisson distribution
- Point and interval estimation
- Central Limit Theorem
- Sensitivity, specificity
- Study designs
- Causal inference
- Hypothesis testing
- Type I and II errors
- Power calculations
- Analysis of variance
- Linear regression

Labs:
- Reading data into SAS
- Creating and using SAS libraries
- Univariate, bivariate analysis
- Using SAS to do plots
- Regression analysis in SAS
Lectures:  
Mon 26 Aug: 10:00 – 12:30 (Room Crossroads 1655)  
Fri 30 Aug: 9:00 – 11:30 (Room Crossroads 1655)  
Tue 03 Sep: 3:00 – 5:00 (Room Crossroads 1755)  
Thu 05 Sep: 3:00 – 5:00 (Room Crossroads 1755)

Labs:  
Thu 29 Aug: 4:00 – 6:00 (SPH II, Lab A/C)  
Fri 30 Aug: 12:30 – 2:30 (SPH II, Lab A/C)  
Fri 06 Sept: 3:00 – 5:00 (SPH II, Lab A/C)

Text:  
There is no required text for this course. Students wishing to follow along with the material are encouraged to consult one of several suitable introductory statistics textbooks; a list of which was described in the letter welcoming students to the Department.

Computing  
SAS

Exams:  
There will be one test to be held at the end of the September 5 class.

Grading:  
A grade (Pass or Fail) will be assigned (pass, fail) based on the test.

Academic Integrity:
The faculty of the School of Public Health believes that the conduct of a student registered or taking courses in the School should be consistent with that of a professional person. Courtesy, honesty and respect should be shown by students toward faculty members, guest lecturers, administrative support staff and fellow students. Similarly, students should expect faculty to treat them fairly, showing respect for their ideas and opinions and striving to help them achieve maximum benefits from their experience in the School. Student academic misconduct refers to behavior that may include plagiarism, cheating, fabrication, falsification of records or official documents, intentional misuse of equipment or materials (including library materials), and aiding and abetting the perpetration of such acts. The preparation of reports, papers, and examinations, assigned on an individual basis, must represent each student’s own effort. Reference sources should be indicated clearly. The use of assistance from other students or aids of any kind during a written examination, except when the use of aids such as electronic devices, books or notes has been approved by an instructor, is a violation of the standard of academic conduct.

Core Competencies (Biostatistics):

1. Describe the roles biostatistics serves in the discipline of public health.
2. Describe basic concepts of probability, random variation, and commonly used statistical probability distributions.
3. Distinguish among the different measurement scales and the implications for selection of statistical methods to be used based on these distinctions
4. Apply descriptive techniques commonly used to summarize public health data.
5. Interpret results of statistical analyses found in public health studies
6. Read in data files using SAS
7. Carry out univariate analysis (numerical summaries, graphical displays) using SAS