

STA 5172: Fundamentals of Biostatistics

Fall 2015

Course Information

Instructor: Dr. Naomi Brownstein

TA: Xiaoyang Guo

Course notes, announcements, materials, office hours, and other important information will be available through the course website on Blackboard. It is your responsibility to check Blackboard and be aware of all information posted on Blackboard and e-mailed to you.

Course Description

This course introduces students to statistical methods used in studying the prevention of disease in human populations. Topics include but are not limited to data collection, sample variation, probability, confidence intervals, hypothesis testing, analysis of variance, contingency tables, correlation, regression, and nonparametric methods. Some of these topics may be omitted, or other topics included, depending on class progress and other circumstances.

Course Objectives

Students should be able to

- Understand the strengths and weaknesses of various study and experimental designs.
- Formulate scientific research questions and translate them into statistical questions.
- Describe basic statistical analysis methods and their assumptions.
- Interpret statistical results in the context of medicine and public health.
- Evaluate sources of evidence for efficacy and validity.
- Understand the capabilities and limitations of statistics in answering medical questions.

Prerequisites

Students are required to have a basic understanding of algebra and arithmetic. No previous course work in probability or statistics is required.

Textbook Information

Required: Rosner, Bernard. *Fundamentals of Biostatistics*, 7th ed.

Required: Motulsky, Harvey. *Intuitive Biostatistics: A Nonmathematical Guide to Statistical Thinking*.

Optional: Woodward, Mark. *Epidemiology Study Design and Data Analysis*, 3rd edition.

Students are responsible for obtaining the required textbook within the first week of class.

The optional texts are not required. Copies will be available for use during the semester.

Software

Students are not required to have experience in statistical software. Tutorials will be provided using *R*, a free and powerful statistical package. Coursework may be completed using other statistical software (such as SAS, Stata, SPSS, Excel, etc.) if the student already has experience with this other software.

Grading

Homework	20%
Monte Carlo Quizzes	5%
Debate	15%
Article Summary/Letter to the Editor	15%
Exam	20%
Creative Contribution/Participation	5%
Data Analysis Project	20%

Grading Scale

90 - 100: A	80 - 89: B	70 - 79: C	60 - 69: D	0 - 59: F
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Final grade percentages ending in a decimal of .5 or greater will be rounded up to the next whole number.

Homework Homework will be collected and graded for correctness. Students may work together to discuss homework, but each student must write up their own solution in their own words. Solutions copied verbatim from another students homework will constitute an honor policy violation and will not receive credit.

Quizzes At the end of each weekly class period (Fridays in August and September, Thursdays in October, November, and December), a quiz may or may not be given, with the decision determined by a chance mechanism. Content may include 1 - 5 questions on material from the previous class period. If a quiz is not given, then the questions still will be given to students for reference. The lowest quiz grade will be dropped. No makeup quizzes will be provided.

Debate Students will select medical topics of current interest to debate as a class. The class will be divided into groups for each topic. Groups will review and evaluate the literature and present their results to the class. Presentations will be followed by a question and answer session, and we will conclude with a discussion. More details will be provided separately.

Exam The take-home exam will be administered over Blackboard may contain a variety of question formats such as free-response, graphing, multiple choice and short answer.

Article Summary/Letter to the Editor Students will select an article in press in a medical journal and describe and analyze its statistical methodology and the implications in

terms of the data quality and subsequent conclusions. More details will be provided separately.

Creative Contribution Each student will add their own brief contribution to the course. Each week, one student have 5-15 minutes to contribute to class based on material previously presented. Numerous contributions are possible, such as discussing an article from the scientific literature or popular press, highlighting a problem from the textbook, analyzing a relevant statistical video, comic, meme, or song, pointing out public misconceptions about the material and more. Students are encouraged to be creative in this endeavor. This is your opportunity to gain more familiarity with a topic, challenge and/or share knowledge with your classmates, and make the material personal and fun!

Data Analysis Project Students will analyze and interpret medical data and summarize the results in the context of medicine and public health. More details will be provided separately.

General Notes Please submit all files electronically in PDF form. This policy is mutually beneficial due to compatibility issues with different versions of Microsoft Office and different operating systems. Many free PDF printer software applications (that will print any type of file to PDF) are available, e.g., PrimoPDF (<http://www.primopdf.com>) or CutePDF (<http://www.cutepdf.com>). You may also feel free to use LaTeX (<http://www.latex-project.org/>), which converts files in text-like formats into PDFs. (LaTeX is a great software package. If you wish to use this, please contact the TA or the instructor for installation instruction files and a document template.)

Religious Observance Policy

Students must check the calendar and inform the instructor by the second week of class if you have any conflicts with the course schedule due to religious observances.

Late Submission Policy

If you know you cannot complete an assignment on time because of an unavoidable conflict (determined on a case-by-case basis), you must arrange with the instructor to complete the assignment EARLY. Accommodations are at the discretion of the instructor and may not be granted. Informing the instructor after the assignment due date is unacceptable, except for a situation like a serious emergency or sudden serious illness.

There is a penalty for turning in assignments late. A 20% deduction will be imposed for each day (or portion of a day) that the assignment is late, up to two days. No late work will be accepted for credit more than 48 hours after the due date and no extensions will be given except with a university approved excuse (e.g., major illness, death of a close family member). All unexcused late work will be penalized; all unexcused work turned in after 48 hours will be given a zero grade. For example, if a test is due Monday at 10 AM and you turn in the test Monday at 10:05 AM, the score will have a 20% deduction. If the test is turned in Tuesday at 10:05 AM, the score will have a 40% deduction. If the test is turned in Wednesday at 10:05 AM, the score is 0.

Academic Honor Policy

Tests and quizzes must be completed without the assistance of any other person. Do not consult any other person (taking this course or not taking this course) about any graded material unless given explicit permission. Collaboration with your group members is allowed for group projects.

The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to . . . be honest and truthful and . . . [to] strive for personal and institutional integrity at Florida State University. (Florida State University Academic Honor Policy, found at <http://dof.fsu.edu/honorpolicy.htm>.)

If you have any questions about whether an action could be considered a violation of the honor policy, you should contact the instructor or TA before engaging in the behavior.

Reuse of Materials

The materials on this course Web site are only for the use of students currently enrolled in the course for purposes associated with this course. Materials should not be retained or further disseminated. For example, journal articles should not be retained after the course is completed. You may keep the course notes for future reference, but please don't transmit or post any materials from this course – they are for your personal use only. Please do NOT share materials (such as tests and quizzes) with any other individuals, including students who may take the course in the future.

American Disabilities Act

Students with disabilities needing academic accommodation should both:

1. Register with and provide documentation to the Student Disability Resource Center
2. Bring a letter to the instructor indicating the need for accommodation and what type. This should be done during the first week of class.

For more information about services available to FSU students with disabilities, contact the:

Student Disability Resource Center
874 Traditions Way
108 Student Services Building
Florida State University
Tallahassee, FL 32306-4167
(850) 644-9566 (voice)
(850) 644-8504 (TDD)
sdrc@admin.fsu.edu
<http://www.disabilitycenter.fsu.edu/>

Syllabus Change Policy

This syllabus is a guide for the course and subject to change during the semester as deemed necessary by the instructor.