Biostatistics I, CTS 527/NUTR 206
Fall 2016

Course Time and Location

September 7, 2016 to December 21, 2016

Lecture Times: Mondays 2-4pm, Sackler 114East

Lab Times: Section 1 (CTS). Wednesdays 1:30-3pm, Sackler 514 (Large Lab)
Section 2 (NUTR). Wednesdays 3:30-5pm, Sackler 514 (Large Lab)

Instructor

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Office hours: by appointment

Lab Instructor

Name: Angie Mae Rodday, PhD, MS
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Office hours: 3-3:30pm, Wednesday, Sackler 514 (Large Lab)

Teaching Assistant

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Course Information

Credit/s: 1.0
Grading Option: A-F
Prerequisites: None

Course Description

This course introduces the basic principles and applications of statistics, as they are applied to problems in health research. The emphasis is on developing an understanding of the assumptions, limitations, practical considerations and critical thinking in the use of statistical methods in health research.

Learning Objectives

Upon successful completion of the course students should be able to:

1. Understand the process of statistical investigation of data used in the health professions.
2. Apply the steps of statistical inference:
    - select appropriate statistical tests for their hypothesis,

- use computers to explore data and perform statistical tests,
- interpret results and computer output for commonly used statistical procedures.

3. Use statistical software (R) to explore and analyze data.

Course Texts and Materials

- Principles of Biostatistics, by Pagano and Gauvreau. Second Edition (Duxbury Press). *Required.*
- Introductory Statistics with R (Statistics and Computing), by Peter Dalgaard. Second Edition (Springer). *Suggested.*
    - Electronic version available through Tufts Library.
- Lecture notes, additional readings, and other material will be posted on Trunk.

Expectations

- Attend all classes and statistical computing labs.
- Read assigned materials prior to class and actively participate in class discussions and online forums.
- Demonstrate an understanding of the use of statistics on assignments, quizzes, and examinations.
- Demonstrate the ability to use statistical programming in analyzing data.

Evaluation

Class Participation.....	5%
Discussion Board……..	10%
Homework (n=5).....	30%
Quizzes (n=2).....	30%
Final Exam.....	25%

Discussion Board

Post a comment, question, or response to another student's post (~3-5 sentences) on the weekly reading assignment using the Forums section of Trunk. Due by 11:59pm on Saturday.

Homework

Homework is due at 5pm on the given date and should be uploaded to the Assignments section of Trunk. Late assignments will not be accepted without advance permission of Dr. Rodday. Although you may work with other students on homework assignments, your handed-in assignments must represent your own work.

Course Schedule*

Week	Topic, Assignment	Readings
Week 1, 9/7	Introduction to biostatistics in health research; types of data; summary measures	Chapter 1, 2, 3 Nature reading 1
Week 2, 9/12	Probability; exploratory data analysis	Chapters 6, 7 Nature reading 2
	Wednesday (9/14): Homework 1 assigned	
Week 3, 9/19	Estimation; central limit theorem; confidence intervals	Chapters 8, 9 Nature reading 3
	Friday (9/23): Homework 1 due	
Week 4, 9/26	Hypothesis testing; T-test	Chapter 10, 11 Nature reading 4
	Wednesday (9/28): Homework 2 assigned	
Week 5, 10/3	Analysis of variance (ANOVA)	Chapter 12 Nature reading 5
	Friday (10/7): Homework 2 due	
Week 6, 10/10	Monday (10/10): Indigenous People's Day—No lecture	Nature reading 6
Week 7, 10/17	*Monday (10/17): Quiz 1* (No lecture)	Nature reading 7
	Wednesday (10/19): No lab	
Week 8, 10/24	Non-parametric tests	Chapter 13 Nature reading 8
	Wednesday (10/26): Homework 3 assigned	
Week 9, 10/31	Analysis of proportions	Chapter 14 Nature reading 9
	Friday (11/4): Homework 3 due	
Week 10, 11/7	Comparing two proportions; 2x2 tables	Chapter 15, 16 Nature reading 10
Week 11, 11/14	Correlation; introduction to linear regression	Chapter 17 Nature reading 11
	Wednesday (11/16): Homework 4 assigned	
Week 12, 11/21	*Monday (11/21): Quiz 2* (No lecture)	
	Wednesday (11/23): Thanksgiving Eve—No lab	
Week 13, 11/28	Linear regression with indicator variables	Chapter 18 Nature reading 12
	Friday (12/2): Homework 4 due	
Week 14, 12/5	Linear regression diagnostics	Nature reading 13
	Wednesday (12/7): Homework 5 assigned	
Week 15, 12/12	Multiple linear regression	Chapter 19 Nature reading 14
	Friday (12/16): Homework 5 due	
Week 16, 12/19	*Monday (12/19): Final Exam*	
	Wednesday (12/21): No lab	

*This schedule is subject to modifications at the discretion of the course instructors.

Important University Policies:

- ***Sexual Misconduct Policy:*** Title IX makes it clear that violence and harassment based on sex and gender is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, gender, and national origin. If you or someone you know has been harassed or assaulted, please contact Kathryn Lange, the Sackler School Sexual Misconduct Reporting Liaison, at 6-6767 or kathryn.lange@tufts.edu. She can help you find appropriate resources and discuss your options. Students may also obtain free confidential counseling through the Student Advisory and Health Administration Office (6-2700). Campus police may be contacted at 6-6911.

- ***Americans with Disabilities Act Policy:*** Tufts University and the Sackler School are committed to providing reasonable accommodations for qualified individuals with disabilities. If you are interested in seeking accommodations in courses or in a laboratory setting, please contact Kathryn Lange, the Sackler School Disability Officer, at 6-6767 or at kathryn.lange@tufts.edu.

- ***Tufts Information Stewardship Policy*** outlines the actions all members of the Tufts community are expected to follow when working with institutional data and systems (http://uit.tufts.edu/?pid=786).

- ***Academic Conduct:*** Academic integrity, including avoiding plagiarism, is critically important. Each student is responsible for compliance with the standards and policies outlined in the Sackler School Student Handbook (http://sackler.tufts.edu/Student-Life/Policies-and-Guidelines). Violations of standards of academic conduct will be sanctioned by penalties ranging from grade reduction and failure of a course up to dismissal from the school, depending on the nature and context of any infraction.