

**Sociology 103A:
Statistical Methods**

Summer 2016, MW 1:00- 4:30 pm
Physical Sciences, Rm. 110
UC Santa Cruz

Instructor: Toni Rouhana
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Office Hours: M-W 10-11:30 am, by appointment.

TA:

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Course Description and Goals:

Today, “We live in a world of statistics” whether we understand the **Math and/or the Logic** behind it we are using and contributing to this world of statistics with almost most of our daily actions now that we are connected 24/7 to the internet. We are constantly using our phones, tablets, laptops and desktop computers where every click, search, commodity we like is contributing to this world of statistics. Even when we are not online, we are also contributing to this world of statistics, for example when we are grocery shopping, scanning our membership id is one of many ways we are contributing to the world of statistics. As you can see by now on an individual level we are all living statistics every day.

Statistical methods are one of many critical methods to studying social phenomena such as inequality, discrimination, segregation, industrialization, gender differences, environmental. To be able to study these phenomena we start with assumptions, theories or hypotheses. As social scientists, we need to substantiate these assumptions to provide an empirically sound analysis or proposition. Statistical methods provide us with tools to be able to describe, test, and analyze social phenomena.

This course will cover both descriptive and inferential statistics. Using statistical techniques, we will learn how to answer sociological questions. Using R, and R studio we will learn statistical as well as programming skills that will give students comparative advantages on the job market.

Textbooks:

Essentials of Social Statistics for a Diverse Society (SECOND EDITION)

By: Anna Leon-Guerrero and Chava Frankfort-Nachmias

Available at The **Bay Tree Bookstore**

Course Format, Requirements, and Grading:

1. Attendance and Participation - 20%: Both attendance and participation in lectures and TA section are **mandatory**. Absences without a legitimate excuse will drive your final grade down. Missing **two sections** is grounds for not passing the course. Students who fail to attend lectures and participate in TA sections will thus fail the course.

Lecture preparation: Students are expected to read the assigned readings prior to lecture (this class is designed based on this premise). Coming prepared to lecture will allow students to be familiar with the material covered and will help students to be engaged with the material presented in this lecture.

2. Mid-term and Final Exams - 40%: There will be one mid-term and one final exam (Multiple Choice).

- Mid-term examination (20%) will cover all the readings, lectures, and exercises in the section of the course immediately preceding the exam.
- The final examination (20%) will be comprehensive, covering all the materials in the course. Given the 5-week class length, there is **NO MAKE-UP EXAM**, unless otherwise agreed with the instructor (an absolutely justifiable reason has to be made with the instructor well before the scheduled date of the exam).

3. Four Homework Assignments - 40%: You are required to submit **four homework assignments** (10% each). All homework assignments will be posted to ecommons a week prior to the submission deadline. You will be answering questions similar to the ones you've encountered in class, and practiced in section with your TA. These assignments will cover concepts we learned in class and exercises that need the use of R-Studio (see below).

Computer Analysis: In this course, we will be using R and R-studio for statistical analysis. I will provide tutorials and cheat sheets and will cover R syntax and usage in lecture. Section time will be used for you to practice exercises and tutorials to understand the statistical concepts and methods as well as practicing R programming.

Plagiarism, Academic Integrity and Misconduct: If you present someone else's words or thoughts as your own, that is plagiarism and a serious violation of academic integrity. Anything more than three consecutive words from another source should include a citation to source. Please familiarize yourself with the University's Academic Integrity Policy: https://www.ue.ucsc.edu/academic_misconduct. I take all violations seriously.

Disability: If you are a student with a disability who requires accommodations to achieve equal access in this course, please submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to me privately during my office hours or by appointment, preferably within the first two weeks of the quarter. I encourage all students who may benefit from learning more about DRC services to contact DRC by phone at 831-459-2089 or by email at drc@ucsc.edu.

Schedule of Classes:

June 20: Overview of the Course & Introduction

Part 1:

- Introductions
- Chapter 1. The What and the Why of Statistics

Part 2:

- What is R?
- Why use R?
- Installing and Introducing R and RStudio

June 22: Numerical Description of Data

Part 1:

- Chapter 2. The Organization and Graphic Presentation of Data
- Chapter 3. Measures of Central Tendency

Part 2: R application and coding

June 27: Normal Curve and Z scores, Binomial and "Normal" Probabilities

Part 1:

- Chapter 4. Measures of Variability
- Chapter 5. The Normal Distribution

Part 2: R application and coding

June 29: Estimation and Inference

Part 1:

- Chapter 6. Sampling and Sampling Distributions
- Chapter 7. Estimation

Part 2: R application and coding

July 4: Holiday: Independence Day - No Class

July 6:

Part 1: **MIDTERM**

- **Midterm** (1 hour)

Part 2: Hypothesis Testing (1): One Sample & Two Samples

- Chapter 8. Testing Hypotheses

July 11: Cross-Classified Data Analysis (1):

Part 1:

- Chapter 9. Bivariate Tables

Part 2: R application and coding

- July 13:** Cross-Classified Data Analysis (2):
Part 1:
- Chapter 10. Analysis of Variance
- Part 2:* R application and coding
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- July 18:** Measures of Association:
Part 1:
- Chapter 11. Regression and Correlation
- Part 2:*
Study guide review
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- July 20:** Final Exam