STAT 311 Online, Winter 2024
Elements of Statistical Methods

Disclaimer: The information in this document is subject to change.

Course Description

Elements of good study design. Descriptive statistics including correlation and regression. Introductory concepts of probability and sampling; binomial and normal distributions. Basic concepts of hypothesis testing, estimation, and confidence intervals; t-tests and chi-square tests. Experience with computer software.

You should take this course if:

- You want a high level understanding of basic statistical concepts and want to better understand how statistics allows for empirical research
- You want to learn how to use statistical software to do statistical analysis
- You have an understanding of basic calculus concepts
- You plan for a career that may require statistical analysis or understanding statistical analysis
- Your academic advisor said you had to

You should not take this course if:

- You want a course that does not include mathematically rigorous exercises
- You do not have familiarity with the basic concepts of calculus
- You are not comfortable learning to program

Course Staff

Instructor:

- Name: Anne Wagner
- Pronouns: She/They
- UW Email: amwag

Teaching Assistant:

- Name: Leon Tran
- Pronouns: He/Him
- UW Email: leontk

Teaching Assistant:

- Name: Qijia He
- Pronouns: She/Her
- UW Email: heqj3

The instructor is responsible for managing the vast majority of the class, and concerns with management of homework, grades, or other issues should always be directed to the instructor rather than teaching assistants. Teaching assistants offer help in responding to questions on discussion boards, holding office hours, and grading. Questions related to the material of the class can be directed at either the instructor or TAs. We are assisted by one graders, not listed here, who should only be contacted through Canvas or Gradescope via the appropriate channels (ie: regrades).

Office Hours

Office hours are a chance for students to sit down in a more one-on-one setting to receive help with homework, review concepts, and ask questions about course materials. As office hours are subject

to change, find the most accurate list of office hours on the course Canvas page.

Students can also receive help from the tutors provided by CLUE (https://academicsupport.uw.edu/clue/).

In person office hours for this class will be held in the Statistics Tutor and Study Center, which is not conducting regular open office hours this quarter (Communications Building B-023 https://stat.uw.edu/academics/tutoring).

Course Resources

As an online course with programming requirements, this course will require access to a computer.

Textbook

The course will closely follow the structure of the freely available, open source text, OpenIntro Statistics, which can be downloaded from https://www.openintro.org/book/os/

We will also draw some readings from the freely available, open source text, Introduction to Modern Statistics, which can be downloaded from https://www.openintro.org/book/ims/

Websites

The course content will be available via a combination of the `Canvas` page (which will include some assignments, links to assignments, notes, lecture recordings, and discussion boards), and `Gradescope` (for some quiz assignments and all programming assignments)

Software

We will be learning to use and using `R` and `RStudio` in this course, both of which are freely available at https://cran.r-project.org/ and https://posit.co/download/rstudio-desktop/ respectively.

Course Structure

This course will consist of a few different types of exercises.

- **R Programming Assignments:** These will consist of programming assignments using the R programming language. Assignments are submitted via Gradescope and are automatically graded with immediate feedback. You may resubmit unlimited times until the due date.
- **RMarkdown Write Ups** These will build upon the programming assignments and require the submission of a PDF file created via RMarkdown, containing plots and discussion related to the programming assignment. These must be submitted by the due date for grading. These will be graded by course staff.
- **Quiz Assignments** Quiz assignments will challenge your thinking with more involved and difficult questions. These questions are not timed, but must be submitted by the due date. These will be graded by course staff.
- **Practice Problems** Practice problems will be straight forward exercises on Canvas offering immediate feedback on accuracy. Like programming assignments, they can be repeated until the due date, but exercises will randomize values each time.

Due dates will correspond to approximately the end of each chapter, but will give some leniency on top of that. Assignments may, as a consequence, be due any day of the week, but should be offered at least 1 week in advance.

Late Policy

Assignments submitted late without prior approval will not receive credit. I understand that managing due dates can be difficult, and encourage you to reach out before submission deadlines for an extension (of a few days) by **emailing the instructor**. The following are appropriate reasons to request an extension:

- You, for some reason you need not detail, need more time to finish an assignment.

Emailed requests for an extension should include **an estimation of when you will submit the assignment by** of no more than a few days past the deadline.

Grade Calculation

Different assignment groups are not weighted - each assignment will be worth a fixed number of points (which will be visible), and will hold that relative weight.

The following benchmarks serve as a minimum guarantee of course grade. This is subject to change, but only in so far as these minimum grades are not violated. (IE: Your final GPA could be higher than listed here, but never lower)

Grade	GPA
98%	4.0
90%	3.5
85%	3.0
80%	2.0
75%	1.5
68%	0.7

Lectures and reading assignments

Lectures will be released at the beginning of each week and will consist of approximately 4-4.5 hours of recordings each week (reduced for holidays). As this course is being recorded concurrently this quarter, lectures may release earlier but I cannot currently offer guarantees.

Recordings will be divided into fundamentals, practice exercises, code exercises, or other small digestible units to try and provided concise sources for reviewing all aspects of a given topic.

Reading assignments will be posted alongside lectures, but should closely follow the schedule listed below.

Collaborative Learning

I believe the learning process is a collaborative effort, and that all parties benefit by working together. Any assignment in this class can be worked on collaboratively; you must show all your own work, and free response answers must be in your own words (Identical responses will receive no credit for either respondent).

When working together on programming assignments, it is inappropriate to directly share, copy, or write code for another student. It is fine to discuss methods, functions, and techniques for solving a problem, but a good rule of thumb is that you should never copy/paste someone's code, type code for someone else, or let them type code for you. Such actions will result in disciplinary action and a potential report to the Office of Community Standards and Student Conduct.

Schedule (Tentative/Approximate)

- Week 1 (1/3)
  - Chapter 0: Introduction to R (Not in text)
- Week 2 (1/8)

  - Chapter 1: Intro to data, sampling, experiments
- Week 3 (1/15)
  - Chapter 2: Summarizing data
- Week 4 (1/22)
  - Chapter 3: Probability
- Week 5 (1/29)
  - Chapter 4: Distributions of random variables
- Week 6 (2/5)
  - Chapter 5: Introduction to inference
- Week 7 (2/12)
  - Chapter 6: Inference for categorical data
- Week 8 (2/19)
  - Chapter 7: Inference for numerical data
- Week 9 (2/26)
  - Chapter 8+9: Linear + Multiple regression
- Week 10 (3/4)
  - Chapter 9: Logistic Regression
- Finals Week
  - Assignment due during Finals

Academic Accomodations

To request academic accommodations due to a disability, please contact Disabled Student Services: 448 Schmitz, 206-543-8924 (V/TTY). If you have a letter from D.S.S. indicating that you have a disability which requires academic accommodations, please present the letter to the instructor so we can discuss what you might need in the class or during an exam.