Statistics 1110: Introductory Statistics
Spring 2025

Lecturer: Dr. Elizabeth Ajazi
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Office: 333 Academic Research Building
Office hours: Tuesdays 3:00-4:00pm (333 ARB), Wednesdays 4:45-6:30pm (via Zoom), and by appointment

Class hours:
Section 001: TR 12:00 – 12:59pm, SHDH 350
Section 002: TR 1:45 – 2:44pm, SHDH 350

Course Description: Our goal in this course will be to understand the foundations of statistics, namely probabilities and how they are used to estimate parameters and draw conclusions. The content of this course falls into two broad categories: probability theory and statistics. We will not cover every possible distribution or hypothesis test, or even touch on many other areas of statistics. However, understanding the material in this course should help you read scientific papers or design experiments or studies with valid statistical analyses. A more detailed list of the topics covered within these two categories is given in the syllabus below. Note that this course is very introductory. If you have previous experience with probability or statistics, this is likely not the course for you.

You are expected to attend all lectures on Tuesdays and Thursdays. You must attend the lecture section you are enrolled in. Activities missed during lectures and/or recitations cannot be made up in any way for any reason.

Calculator: You will need some sort of calculator for this course. A graphing calculator (TI-83 or TI-84) is recommended. Please bring your calculator to every lecture and recitation.

Textbooks:

- *Introductory Statistics for Data Analysis,* Warren J. Ewens and Katherine Brumberg (ISBN-13: 978-3031281884)
- *Introductory Statistics for the Life and Biomedical Sciences*, Julie Vu and David Harrington. (Free download: https://www.openintro.org/book/biostat/ or a hardcopy can be purchased through Amazon)

  Google document of known textbook typos: https://docs.google.com/spreadsheets/d/1k_NivXZftdlRgRyTT3fUZCndW4eoXCzAs-DEIml6K3Y/edit#gid=0

Grading: Your final grade will consist of four homework assignments, three midterm exams, and a final exam. Final grades will not be rounded up.

Weighted Assignments	
Homework	40%
Exams	60%

Grading Table	
Letter Grade	**%**
A+	≥ 97.00
A	93.00 – 96.99
A-	90.00 – 92.99
B+	87.00 – 89.99
B	83.00 – 86.99
B-	80.00 – 82.99
C+	77.00 – 79.99
C	73.00 – 76.99
C-	70.00 – 72.99
D+	67.00 – 69.99
D	60.00 – 66.99
F	≤59.99

Homework: There will be four graded homework assignments due in the recitation Canvas site and weekly ungraded supplemental homework assignments.

Graded homework will appear as an assignment in the recitation Canvas site. Homework will be graded on completion and correctness. The lowest homework grade will be dropped.

Deadlines: **Assignments in Canvas will close at the time of the deadline and cannot be reopened. Therefore, no late assignments can be accepted, and no extensions will be given. No exceptions for any reason.** Technical issues arise sometimes, so I encourage you not to wait until the last minute to submit your assignments. Any technical issues must be reported at least 24 hours before the due date.

Homework 1 due Sunday, February 9th by 11:59 PM ET
Homework 2 due Wednesday, March 5th by 11:59 PM ET
Homework 3 due Wednesday, April 9th by 11:59 PM ET
Homework 4 due Friday, April 25th by 11:59 PM ET

All regrade requests must be submitted **within three days** after the grade has been published in Canvas. Regrades will only be considered in situations where a legitimate grading error has occurred. ***Accidentally selecting the wrong answer in a drop down or multiple choice, incorrectly rounding answers, rounding imprecisely, rounding to the wrong decimal place, etc. are not valid regrade requests and will not be considered.*** To submit a regrade request, create a comment directly within the graded assignment in Canvas **and** email your TA. General questions regarding grading should be sent to your TA.

Ungraded homework: Supplemental homework will be available every week in the recitation Canvas site Files as a Word document. **These are not optional assignments**, and you are expected to work through these problems throughout the week to prepare for recitation. During recitation, the TA will review the supplemental homework problems in detail.

Exams: There will be three midterm exams and a final exam. The exams will cover material from the lectures, recitations, graded homework, supplemental homework, midterm reviews, and practice exams. **No make-up exams will be given**, but the lowest exam grade will be dropped. All exams are timed (90 minutes) and will be available online in the recitation Canvas site. The midterm exams will be available for you to take at any time within the designated 24-hour period. The final exam will be available for you to take at any time within the designated three-day period. **No lecture or office hours will be held on exam days.** If the exam dates do not work with your schedule, please reconsider taking this course when it better fits your schedule.

Exam 1 available on Thursday, February 13th from 12:00 AM – 11:59 PM ET
Exam 2 available on Thursday, March 20th from 12:00 AM – 11:59 PM ET
Exam 3 available on Tuesday, April 29th from 12:00 AM – 11:59 PM ET
Final exam available from Thursday, May 8th – Saturday, May 10th

Friday recitations: You are expected to attend all recitations, and you must attend the recitation section you are enrolled in. Recitations will be used to discuss the weekly course material, review weekly supplemental homework, review submitted graded homework, and answer questions on upcoming homework assignments. A Google Form will be available weekly for you to submit the problems and/or topics you'd like to cover during recitation. All requests may not be covered due to limited time, but you are always welcome to ask additional questions outside of recitation hours.

Artificial Intelligence (AI) and academic integrity: AI is not supported in this course. The work you produce should be your own, free from any AI assistance. Although it may be tempting to use AI in this course, you are doing a disservice to yourself by using it to solve any problems, as it inhibits you from learning the processes and skills necessary for research outside this course. You should note that AI can be unreliable, showing incorrect work and providing erroneous answers that appear to be correct. Submitting work that contains AI-generated content will be considered a violation of Penn's Code of Academic Integrity, and any suspected use will be referred to the Center for Community Standards & Accountability (CSA).

Topics:

1. **Statistics and Probability Theory**
   Introductory Statistics for Data Analysis: Sections 1.1, 1.2
   Introductory Statistics for the Life and Biomedical Sciences: Sections 1.3.1, 1.3.3
2. **Variables and Analyzing Data**
   Introductory Statistics for the Life and Biomedical Sciences: 1.2, 1.2.1, 1.2.2, 1.4.1, 1.4.2, 1.4.3
3. **Data Graphs and Displays**
   Introductory Statistics for the Life and Biomedical Sciences: 1.4.4, 1.6.1, 1.6.3
4. **Probability Theory**
   Introductory Statistics for Data Analysis:2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 3.5
   Introductory Statistics for the Life and Biomedical Sciences: 2.1, 2.1.2, 2.1.3, 2.1.4, 2.1.6, 2.1.7, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5
5. **Probability Distributions**
   Introductory Statistics for Data Analysis: 4.1, 4.2, 4.3, 4.4, 4.5, 4.7, 4.8
   Introductory Statistics for the Life and Biomedical Sciences: 2.1.5

6. **Binomial Distribution**
   Introductory Statistics for Data Analysis: 4.5, 4.7, 4.8, 5.6
   Introductory Statistics for the Life and Biomedical Sciences: 3.2, 3.2.1, 3.2.2
7. **Normal Distribution**
   Introductory Statistics for Data Analysis:6.1, 6.3, 6.4, 6.6, 6.10
   Introductory Statistics for the Life and Biomedical Sciences: 3.3.1, 3.3.2, 3.3.3, 3.3.4, 3.3.5
8. **Normal Approximation**
   Introductory Statistics for the Life and Biomedical Sciences: 3.3.6
9. **Introduction to Inference**
   Introductory Statistics for Data Analysis: 6.7
   Introductory Statistics for the Life and Biomedical Sciences: 4.1, 4.1.1, 4.1.2
10. **Confidence intervals**
    Introductory Statistics for Data Analysis: 6.5, 8.1, 8.3
    Introductory Statistics for the Life and Biomedical Sciences: 4.2.1, 4.2.2
11. **P-values**
    Introductory Statistics for Data Analysis: 9.1, 9.2, 9.3
    Introductory Statistics for the Life and Biomedical Sciences: 4.3.3, 4.3.4, 4.3.6
12. **One sample z-test**
    Introductory Statistics for the Life and Biomedical Sciences: 4.3, 4.3.1, 4.3.2, 4.3.5
13. **One sample t-test**
    Introductory Statistics for Data Analysis: 13.1
    Introductory Statistics for the Life and Biomedical Sciences: 5.1, 5.1.1, 5.1.2
14. **Paired t-test**
    Introductory Statistics for Data Analysis: 13.3
    Introductory Statistics for the Life and Biomedical Sciences: 5.2
15. **Two sample t-test**
    Introductory Statistics for Data Analysis: 8.3, 13.2
    Introductory Statistics for the Life and Biomedical Sciences: 5.3, 5.3.1, 5.3.2
16. **Proportions**
    Introductory Statistics for Data Analysis: 8.1, 8.1.1, 8.1.2
    Introductory Statistics for the Life and Biomedical Sciences: 8.1, 8.1.1, 8.1.2
17. **Chi-square Test**
    Introductory Statistics for Data Analysis: 11.1, 12.1, 12.2
    Introductory Statistics for the Life and Biomedical Sciences: 8.3, 8.3.1, 8.3.2, 8.3.3, 8.3.4, 8.4
18. **Correlation**
    Introductory Statistics for the Life and Biomedical Sciences: 1.6.1

Any changes made to this syllabus will be announced online and/or in class.