

Statistics 1110: Introductory Statistics

Fall 2022

Lecturer: Dr. Elizabeth Ajazi

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Office: 333 Academic Research Building

Office hours: via Zoom Tuesdays and Thursdays 12:30 – 1:30pm and by appointment

Class hours:

Section 001: TR 10:15 – 11:14am, SHDH 351

Section 002: TR 1:45 – 2:44pm, SHDH 351

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.

Calculator: You will need some sort of calculator for this course. A graphing calculator (TI-83 or TI-84) is recommended. **Calculators with internet access are not permitted during exams.**

Textbook: *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)

Grading: There will be seven homework assignments and three midterms. Attendance and participation *during Friday recitations* will also count towards your final grade. Attendance during lectures on Tuesdays and Thursdays is only taken for informational purposes and will not count towards your final grade, but you are encouraged to attend all classes.

Recitation attendance/participation	10%
Homework	30%
Midterms	60%

Recitation attendance/participation: Attendance will be taken at the beginning of every Friday recitation. You can miss up to two recitations without an impact on your final grade.

Recitation attendance/participation rubric:

	5 points	4 points	3 points	2 points	1 point	0 points
Attendance (excused or unexcused absences)	0-2 absences, tardies, or early departures	3 absences, tardies, or early departures	4 absences, tardies, or early departures	5 absences, tardies, or early departures	6 absences, tardies, or early departures	7 or more absences, tardies, or early departures
Participation	Participated in all class activities with a good attitude.	Participated in <i>almost all</i> class activities with a good attitude for all activities.	Participated in all class activities, but with a poor attitude in at least one of the activities.	Participated in <i>some</i> of the class activities with a good attitude for all activities.	Participated in some of the class activities with a poor attitude for at least one of the activities.	Did not participate in any class activities.

Homework: There will be seven homework assignments due through Canvas. Homework will be graded on completion and correctness. Correct answers to the homework assignments will be reviewed during recitations. **Canvas will close at the time of the deadline and cannot be reopened. Therefore, no late assignments can be accepted. No exceptions.** The lowest two homework grades will be dropped.

Homework 1 due Wednesday, September 14th by 11:59 PM ET
 Homework 2 due Wednesday, September 21st by 11:59 PM ET
 Homework 3 due Wednesday, October 5th by 11:59 PM ET
 Homework 4 due Wednesday, October 19th by 11:59 PM ET
 Homework 5 due Wednesday, November 2nd by 11:59 PM ET
 Homework 6 due Wednesday, November 16th by 11:59 PM ET
 Homework 7 due **Sunday, December 4th** by 11:59 PM ET

Midterms: There will be three midterms. No make-up exams will be given. If the midterm dates and times do not work with your schedule, please reconsider taking this course when it better fits your schedule.

Midterm 1 on Thursday, September 29th
 Midterm 2 on Thursday, October 27th
 Midterm 3 on Thursday, December 8th

Masking requirement: Until further notice, masks during lecture are optional, with a recommendation that people with underlying medical conditions wear masks indoors. The disabled access seating in the lecture room is reserved for those needing accommodations or who are wearing masks, but you are welcome to sit anywhere if you are wearing a mask. If you choose to not wear a mask, you are welcome to sit in any area other than the reserved disabled access seating.

Friday recitations: Recitations are required and participation will count towards your final grade. Recitations will be used to discuss the weekly course material, review submitted homework, and answer questions on upcoming homework assignments.

Topics:

- 1. Statistics and Probability Theory**
(Sections 1.3.1, 1.3.3, 1.3.4)
- 2. Variables and Analyzing Data**
(Sections 1.2, 1.2.1, 1.2.2, 1.2.3, 1.4.1, 1.4.2, 1.4.3, 1.5, 3.1.1)
- 3. Data Graphs and Displays**
(Sections 1.4.4, 1.6.1, 1.6.3)
- 4. Probability Theory**
(Sections 2.1, 2.2.1, 2.2.2, 2.2.3, 2.2.4)
- 5. Binomial Distribution**
(Sections 1.3.1, 1.3.3, 1.3.4)
- 6. Normal Distribution**
(Sections 3.3.1, 3.3.2, 3.3.3, 3.3.4, 3.3.5)
- 7. Introduction to Inference**
(Sections 4.1, 4.1.1, 4.1.2)
- 8. Confidence intervals**
(Sections 4.2.1, 4.2.2)
- 9. P-values**
(Sections 4.3.4, 4.3.6)
- 10. One Sample Mean Test**
(Sections 4.3, 4.3.1, 4.3.2, 4.3.3, 4.3.5, 5.1, 5.1.1, 5.1.2)
- 11. Paired t-test**
(Section 5.2)
- 12. Wilcoxon Rank Signed Test**
- 13. Two Sample t-test**
(Sections 5.3, 5.3.1, 5.3.2)
- 14. Wilcoxon Rank Sum Test**
- 15. 1-Way ANOVA**
(Sections 5.5, 5.5.1, 5.5.2, 5.5.3, 5.5.4, 5.6)
- 16. Proportions**
(Sections 8.1, 8.1.1, 8.2, 8.2.1, 8.2.2, 8.2.3)
- 17. Chi-square Test**
(Sections 8.3, 8.3.1, 8.3.2, 8.3.3, 8.3.4, 8.4)
- 18. Correlation**
(Sections 1.6.1, 6.3.2)
- 19. Linear regression**
(Sections 6.1, 6.2, 6.3, 6.3.1)

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