

CS 206: Introduction to Statistics

126 Adele Simmons Hall; Tuesday & Thursday 2:00-3:20PM

Instructor: Ethan Meyers **Office:** 133 ASH
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Office Hours: Office hours are on Mondays 2:30-3:30pm, Wednesdays from 11-12pm and by appointment. Please feel free to email me to set up an appointment.

Teaching Assistants:

David Hogan: dmh17@hampshire.edu James Szkobel-Wolff: jaas16@hampshire.edu

About the Course

Course Objectives: The goal of this course is to provide students with an introduction to key concepts in descriptive and inferential Statistics, and how to apply statistical analyses to real datasets. In addition to learning statistics, students will learn how to use the R programming language to analyze data.

Distribution: Mind, Brain, and Information

Course Website: <https://moodle.hampshire.edu/course/view.php?id=6503>

Course books and other material: Lock, R.H., Lock, P.F., Lock, K.M., Lock, E.F., Lock, D.F. (2013/2017). *Statistics: Unlocking the Power of Data*. Hoboken, N.J.: John Wiley. This book can be purchased from the Hampshire College Bookstore. Either first or second edition of the book should be fine.

Additional readings and resources will be available on the course website.

Course Format: The format of the course will be lectures, discussions, and in-class activities. There will be some overlap between the material covered in class and the material covered in the book. A large part of the class will work through the concepts of statistics and examine real problems so that students gain the confidence and skills to do statistics on their own. Therefore, students must complete the assigned readings as well as attend class in order to master the material covered in this course. Adjustments to the required reading may be made frequently, which also makes it important to attend class to hear announcements concerning the reading assignments and to check Moodle for updated assignments.

Expectations for work completed: In this course students are expected to spend at least eight hours a week of preparation and work outside of class time. This time includes reading sections of the textbook, completed assigned problems, and analyzing data using R.

Course topics: The course is divided into three sections: descriptive statistics, inferential statistics using resampling methods, and inferential statistics using parametric methods.

Course Assignments: The course assignments will consist of readings, weekly worksheets where you will use R to analyze data, and a final project where you will do a more in depth analysis investigating one specific question. You will also be required to do a presentation on your final project. The questions presented on the worksheet problems may be discussed with other members of the class, but the work turned in must be your own since it is important that you understand all the material yourself. Obviously copying from other students is not allowed. Everyone who you discussed the worksheet with must be listed on the top of the worksheet.

RStudio class server website: <https://asterius.hampshire.edu/>

General Course Policies

Due Dates: In order to understand the material covered in class it is **critical** that you keep up with the assignments. Thus **all assignments must be turned in on time** as indicated on the class website. **Failure to turn in work in on time will result in receiving a no evaluation for this class.** In particular a three strikes policy will be implemented in this class: **if you fail to turn in three assignments on time you will not receive an evaluation for the class.** Extensions may be granted in rare circumstances if you contact me well in advance to get my permission but otherwise will not be granted.

Attendance: Class attendance is a requirement of this course. I also expect you to be to class on time. Missing class will have an impact on your evaluation.

Laptops: If you own a laptop, you may bring it to class in order to complete in class exercises (if you don't own a laptop you will be able to share a computer with other students or use one of the computers in the classroom). However, obviously you should not use your laptop for email, web browsing or any other activity that is not related to the class.

Email and Slack: Email from this class will be sent to your Hampshire account. Make sure to check this email account at least twice a day. You can always have your Hampshire email forwarded to another account if that is easier for you. Additionally, Slack.com will be used to as a main means of communication program in this class.

Requirements for Evaluation: Students are required to attend class, do the assigned readings, and complete all the assigned worksheets. **Any student who does not turn in the assignments on time will NOT receive an evaluation for the course.**

Incompletes: An "incomplete" will be granted at the discretion of the instructor only under unusual and incapacitating circumstances. If you miss more than two classes, or feel that you are in danger of not completing the course for any reason, please come see me as soon as possible. Any student seeking an incomplete must (1) request the "incomplete" in writing *prior to the last week of class*, (2) provide appropriate written documentation of the illness or circumstances, and

(3) make specific arrangements with the instructor to complete the required coursework. Students will have four weeks to complete any missed exams/assignments to replace the incomplete with an evaluation. Failure to complete the required work within this time frame will result in a “no evaluation.”

Special Needs: I encourage students with disabilities or special needs to discuss with me whatever arrangements may be needed during the first week or two of class. Please visit Aaron Ferguson, Director, Office of Accessibility Resources and Services, at x5498 or accessibility@hampshire.edu, or stop by his office in Lemelson. Getting the proper documentation in ensures you can receive appropriate accommodations.

Academic dishonesty: All students and faculty, whether at Hampshire or another institution are bound by the ethics of academic integrity. Academic dishonesty includes: cheating on assignments; plagiarizing (misrepresenting as one’s own anything done by another, including quoting from readings without acknowledging sources); submitting the same or substantially similar papers for more than one course without consent of all instructors concerned; depriving another of necessary course materials; sabotaging another’s work; and fabricating data, information, or citations.

All cases of suspected plagiarism or academic dishonesty will be referred to the Dean of Advising who will review documentation and meet with student and faculty member. Individual faculty, in consultation with the Dean of Advising, will decide the most appropriate consequence in the context of the class. This can range from revising and resubmitting an assignment to failing the course. Beyond the consequence in the course, CASA considers first offenses as opportunities for education and official warning. Multiple or egregious offenses will have more serious consequences. Suspected instances of other breaches of the ethics of academic integrity, such as the falsification of data, will be treated with the same seriousness as plagiarism and will follow the same process. For further details about Hampshire’s policies regarding the Ethics of Scholarship please see Non Satis Non Scire: <https://handbook.hampshire.edu/node/87>

Course Outline

(Schedule is subject to change, please check the class website for the latest version)

Class	Date	Day	Topic
1	6-Sep	Th	Class overview
2	11-Sep	Tu	Introduction to R
3	13-Sep	Th	Categorical and quantitative data
4	18-Sep	Tu	Statistics for central tendency
5	20-Sep	Th	Statistics for quantifying spread
6	25-Sep	Tu	Statistics for quantifying spread continued
	27-Sep		Advising day – no class
7	2-Oct	Tu	Correlation
8	4-Oct	Th	Data manipulation and review
	9-Oct		October break – no class
9	11-Oct	Th	Sampling distributions
10	16-Oct	Tu	Interval estimates
11	18-Oct	Th	Confidence intervals using the bootstrap
	23-Oct	Tu	Engage conference – no class
12	25-Oct	Th	Hypothesis tests for a single proportion
13	30-Oct	Tu	Hypothesis tests for correlation
14	1-Nov	Th	Observational and experimental studies, hypothesis tests for two means
	6-Nov		No class – away at SfN (Election day)
15	8-Nov	Th	Hypothesis test for two means continued
16	13-Nov	Tu	Hypothesis tests for more than two means
17	15-Nov	Th	Randomization test review
18	20-Nov	Tu	Parametric probability distributions
	22-Nov		Thanksgiving – no class
19	27-Nov	Tu	Parametric tests: t-test
20	29-Nov	Th	Parametric tests: ANOVA
21	4-Dec	Tu	Linear regression
22	6-Dec	Th	Linear regression continued
23	11-Dec	Tu	Final project presentations
24	13-Dec	Th	Final project presentations