

Stat 3202: Introduction to Statistical Inference for Data Analytics Autumn Semester, 2019

Instructor

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Office Hours:

Tuesday 11:00 am - 12:00 pm, Pomerene Hall 161
Wednesday 11:00 am - 12:00 pm, Pomerene Hall 161
By appointment, Pomerene 114 or Cockins Hall, room TBD
I strongly encourage proactive attendance of office hours.

Course Structure

Students must be enrolled in one of the following **lecture sections**:

Lecture 10 (27616): W F, 9:35 am – 10:55 am, Pomerene 250
Lecture 35 (33060): T R, 9:35 am – 10:55 am, Pomerene 250

Students must also be enrolled in one of the following **recitation sections**:

Recitation 20 (27617): M, 9:10 am – 10:05 am, Pomerene 155 (Guowei Li,
li.7230@buckeyemail.osu.edu)
Recitation 30 (27618): M, 10:20 am – 11:15 am, Pomerene 155 (Guowei Li,
li.7230@buckeyemail.osu.edu)
Recitation 40 (33017): M, 3:00 pm – 3:55 pm, Pomerene 155 (Jianhao Zhang,
zhang.4487@buckeyemail.osu.edu)
Recitation 50 (33018): M, 4:10 pm – 5:05 pm, Pomerene 155 (Jianhao Zhang,
zhang.4487@buckeyemail.osu.edu)

Course Description: Foundational inferential methods for learning about populations from samples, including point and interval estimation, and the formulation and testing of hypotheses. Statistical theory is introduced to justify the approaches. The course emphasizes challenges that arise when applying classical ideas to big data, partially through the use of computational and simulation techniques.

Prerequisites: C- or better in 3201, or permission of instructor. Not open to students with credit for 4202.

Required Course Materials

Required Textbook: *Mathematical Statistics with Applications, 7th edition*, by Wackerly, Mendenhall, and Scheaffer, Brooks/Cole, Cengage Learning, 2008. eBook PDFs are much cheaper and are highly encouraged.

Required software: R programming language (<https://www.r-project.org/>) and the R Studio coding platform (<https://www.rstudio.com/>) will be used in class and for programming assignments. These resources are open-source and free to download.

Class Policies

The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

Student conduct: all students, TAs, graders, and the professor must feel safe, comfortable, and welcomed in our classroom. Additionally, any behavior that detracts from a reasonable learning environment, such as inappropriate talking during class, is not permitted. Students who do not show this respect to others or who cause disruption to other students or the instructor will be asked to leave. University policies should be reviewed here: <https://studentconduct.osu.edu/>.

Any student who feels as though they have been affected by a breach of the student code of conduct should discuss it with their TA or professor. A formal report can be filed here: <https://studentconduct.osu.edu/>.

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at titleix@osu.edu

Distractions: cell phones should be kept away during class. Although we will often be coding during class, laptops should be used only for class-related activity. Absolutely no TV streaming or other content that can distract others is permitted.

Communication: due to FERPA considerations, all electronic communication with your TA and professor must be done with your official Ohio State email account. Email subject lines should be reasonably informative, including the student's name, class section (TR or WF), course number, and brief subject. Emails should be written professionally and respectfully.

Attendance: students are expected to attend every lecture and every recitation. Because Ohio State does not have a universal student absence policy, **absences will be considered on a case by case basis**. Your case may be strengthened with documentation such as doctor's notes, OSU athletics schedules, court summons, advance notice, and strong prior attendance. In the event of illness, **personal medical details are none of my business**. In the event of an excused missed

recitation assignment or exam, **it is the student's responsibility to schedule a mutually agreeable time with their TA or professor to complete the assignment.**

Disability and Learning Accommodations: students with documented accommodations should discuss their needs with the professor as soon as possible, and ensure all necessary requirements have been fulfilled on behalf of the Ohio State Office of Student Life Disability Services.

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling 614-292-5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at 614-292-5766 and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-800-273-TALK or at suicidepreventionlifeline.org.

Academic Integrity

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>.

Grades and Assignments

In general, all assignments must include thorough work, Work must be neat, organized, and presented professionally. All assignments must represent the student's own unique work.

Homework	Labs	Project I	Project 2	Midterm 1	Midterm 2	Final
15%	15%	10%	10%	15%	15%	20%

Homeworks: homework assignments will be periodically assigned throughout the semester. Homeworks must be submitted at the beginning of class on the assigned due date. Solutions will be posted, so late assignments are not accepted. Grades will be earned based on completeness, correctness, supporting work, and organization. The lowest grade of submitted homeworks will be dropped at the end of the semester. Students are encouraged to work together on homework assignments, but all students must submit their own unique work.

Labs: lab activities will be given during some of the recitation sessions. Labs must be completed in R Markdown. Solutions will be posted, so late assignments are not accepted. Grades will be earned based on completeness, correctness, supporting work, organization, and presentation. Students are encouraged to work together on lab assignments, but all students must submit their own unique work.

Projects: two projects will be assigned during the semester. Students will work in groups of 3-4 to analyze a given data set, present on their findings, and submit a written report summarizing their work in a professional format. Grades will be earned based on completeness, correctness, supporting work, organization, presentation, and collaboration.

Midterms: two mid-term exams will be given. Relevant reference may be provided by the instructor. Grades will be earned based on completeness, correctness, supporting work, and organization.

Final Exam: The final exam will be cumulative and must be taken at the time scheduled by the university registrar. Relevant reference may be provided by the instructor. Grades will be earned based on completeness, correctness, supporting work, and organization.

Grading Cutoffs: cutoffs are inclusive. For example, a 93.0000% earns an A. 92.9999% earns an A-. Anything below 60% earns an F. In the interest of fairness to all students, grades will not be adjusted for individuals.

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
93%	90%	87%	83%	80%	77%	73%	70%	67%	63%	60%	Below 60%

Grade disputes: If you believe that an error was made regarding a grade, you have one week from the date it was returned to the class to submit a dispute to the instructor. Disputes must be submitted in writing, and clearly explain why the grade should be reviewed. The instructor may reject disputes, and/or review the entire assignment and potentially revise other errors previously made during grading. The instructor will review all disputes on a case by case basis.

Data Analytics Learning Center

GTAs for **Stat 3201, 3202, 3301, 3302, 3303** and **4620** will hold their office hours in the DALC. You can find the hours during which the GTA for your Statistics class will be available [here](#). If the DALC is staffed by a GTA for another Statistics course when you stop by, he or she will help you if possible, but may not be able to answer all of your questions.

In rare situations due to last minute emergencies, the Statistics GTA assigned to the DALC may not be able to attend his or her office hours. If the DALC is closed when the schedule indicates it should be open, we recommend waiting for a few minutes. If the room is still not staffed by your Statistics GTA after a reasonable amount of time, please email your instructor to let us know about the problem. You can also contact your Statistics GTA to see about arranging a make-up time to meet.

Topics and Readings

Topic Subject	Textbook Reading
T0 Introduction to Statistical Inference	Ch. 7, Sec. 8.1
T1 Point Estimation I	Sec. 8.2 - 8.3
T2 Point Estimation II	Sec. 9.3 - 9.5
T3 Point Estimation III	Sec. 9.6 - 9.7
T4 Confidence Intervals	Sec. 8.5 - 8.9
T5 Bootstrap	TBD
T6 Hypothesis Testing	Sec. 10.1 - 10.9
T7 Nonparametric Testing	Sec. 15.1 - 15.4
T8 Additional Testing, or Regression	TBD
T9 Additional Testing, or Regression	TBD
T10 Bayesian Inference	Sec. 16.1-16.4

Changes to this Syllabus

The instructor reserves the right to update policies as necessary throughout the semester, so students should review this document periodically. Changes will be announced to students in class and/or through Carmen.

For situations not described in this syllabus, the instructor reserves the right to review circumstances on a case by case basis.

Version 1; Wednesday, August 14, 2019