



THE OHIO STATE UNIVERSITY

COLLEGE OF ARTS AND SCIENCES

STAT 3450: BASIC STATISTICS FOR ENGINEERS SPRING 2025 SYLLABUS

Course Overview

Instructor

Dr. Atinuke Adebanji
Email address: adebanji.1@osu.edu
Course website: <http://carmen.osu.edu>
Lectures: TR 4:10 PM – 05:05 PM
Where: EA0170
Office hours: Cockins Hall 340D, Tuesdays 1:00 PM - 2:00 PM and
Thursdays 1:00 PM – 2:00 PM or by appointment

Graders

Zhang, Yuanheng zhang.15336@buckeyemail.osu.edu
Jiang, Wentao jiang.3122@buckeyemail.osu.edu

Role: Grading homework assignments and monitoring the course discussion board.

MATH/STAT LEARNING CENTER (MSLC) TUTORING HOURS (IN PERSON AND VIA CARMEN ZOOM) - Hours begin 01/13

Prerequisites

Calculus, integration, exponential function, finite and infinite sums, union, and intersection of sets. Prerequisite courses are Math 1152 (153), Math 1161, Math 1172 (254), or Math 1181.

Course description

STAT 3450 provides an introduction to probability and statistics targeted mainly toward students studying mechanical, welding, and biomedical engineering. Topics covered include probability, random variables, the normal and binomial distributions, confidence intervals for means, hypothesis tests for means, multi-factor experiments, and experiments with blocking.

Course Learning Outcomes

Expected Learning Outcomes (ELOs): Students who successfully complete this course should be able to:

- 1.1 Use logical, mathematical, and/or statistical concepts and methods to represent real-world situations.
- 1.2 Use diverse logical, mathematical, and/or statistical approaches, technologies, and tools to communicate data symbolically, visually, numerically, and verbally.
- 1.3 Draw appropriate inferences from data based on quantitative analysis and/or logical reasoning.
- 1.4 Make and evaluate important assumptions in estimation, modeling, logical argumentation and/or data analysis.
- 1.5 Evaluate social and ethical implications in mathematical and quantitative reasoning.

This course also satisfies the Legacy General Education requirement in Data Analysis, which has the following goals and expected learning outcomes:

Goals: Students develop skills in drawing conclusions and critically evaluating results based on data.

Expected Learning Outcomes:

1. Students understand basic concepts of statistics and probability.
2. Students comprehend the methods needed to analyze and critically evaluate statistical arguments.
3. Students recognize the importance of statistical ideas.

Course materials

Required: *Principles of Statistics for Engineers and Scientists, 2nd Edition*, by William Navidi. Available digitally via McGraw Hill Connect.

Course delivery

We will meet in person during our regularly scheduled class time throughout the semester for most of the lectures. However, some classes may be online via CarmenZoom when extreme weather conditions or health concerns make in-person meetings impracticable. Also, some lectures may be pre-recorded and posted for asynchronous learning.

Each week, we will cover approximately 110 minutes of content in total. You will be responsible for watching recorded videos and studying the assigned material. In addition to the lecture materials, quizzes or homework assignments will be posted on Carmen.

Please check the course webpage regularly for important announcements, and homework/assignments solutions. The instructor and teaching assistants will also manage active discussion boards via Carmen.

Course Technology

For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at <https://ocio.osu.edu/help/hours>, and support for urgent issues is available 24x7.

- **Self-Service and Chat support:** <http://ocio.osu.edu/selfservice>
- **Phone:** 614-688-HELP (4357)
- **Email:** 8help@osu.edu
- **TDD:** 614-688-8743

Baseline technical skills necessary for online classes

- Basic computer and web-browsing skills
- Navigating Carmen; the following website may help you if you encounter difficulties with Carmen: <https://resourcecenter.odee.osu.edu/canvas/>.

Homework Assignments

There will be regular homework assignments to be submitted through McGraw-Hill Connect. Periodically, there will also be homework where students will be expected to show their work and upload a PDF file to Carmen. The lowest two homework assignments will be dropped. Thus, there are no extensions for homework. If you miss a homework, it will count as one of your dropped scores.

Quizzes

There will be quizzes and due times will be provided. The lowest two quizzes will be dropped. Thus, there are no extensions for quizzes. If you miss a quiz, it will count as one of your dropped scores.

Exams

There will be three proctored exams. Two continuous assessment exams will be given:

Exam 1: Tuesday, February 25, 2025, 4:10 PM – 5:00 PM

Exam 2: Thursday, April 3, 2025, 4:10 PM – 5:00 PM

Comprehensive Exam: Monday, April 28, 2025, 6:00 PM – 7:00 PM

The location for the midterm will be in our regular classroom.

Important things to know about exams:

For both midterms and the final exam, students will be allowed to bring one 8 ½ by 11-inch sheet of notes (front side only) that will be turned in with the exam. No other materials are allowed during the exams.

The final exam will be cumulative, with an emphasis on those topics covered after the second midterm.

At a minimum, a basic calculator will be necessary for all exams. A TI 83/84/Nspire is preferred and will be discussed throughout the course.

- If you cannot be available at these exam times for unavoidable reasons, you must speak with the course instructor immediately. **If you fail to take an exam during the time when it is available without any communication with us to explain, we will not allow you to make up for the exam unless there is an emergency that you can document.**
- All exams are **closed book/closed notes** and will be **written in person**
- Tablets, cell phones, and other communication devices are not allowed. Statistical tables will be provided as needed. We take academic honesty very seriously in this course. You may communicate with only the instructor if you have any questions during the exam periods.

You have until one week after receiving your grades on the exams to dispute the grade; the same applies to any homework grade. Note that when asking for a question to be re-graded, the entire assignment/exam may be re-graded, so you risk losing more points than you gain back.

Grading and faculty response

Homework and exams

Component	Percentage
Homework	20
Quizzes	10
Exam 1	20
Exam 2	20
Comprehensive Final	30
Total	100

Final course grades will be assigned based on the standard grading scale.

A: 93-100; A-: 90-92; B+: 87-89; B: 83-86; B-: 80-82; C+: 77-79; C: 73-76;
C-: 70-72; D: 60-69; F: below 60

This grading scale is subject to adjustment if it appears necessary due to overall class performance. These adjustments will only raise a student's grade, not lower it.

Tutor Room and Help Hours

The Mathematics and Statistics Learning Center (MSLC) will be offering both in person and online tutoring via Zoom. More details will be shared on Carmen once available.

Faculty feedback and response time

We are providing the following list to give you an idea of our intended availability throughout the course. (Remember that you can call **614-688-HELP** anytime if you have a technical problem).

Preferred contact method

- If you have questions about the lectures or notice any typos in the materials, please email the instructor. The instructor will reply to e-mails within **24 hours on school days**. You may also use the office hours.

Grading and feedback

- Sample solutions to homework assignments will be posted soon after all the papers are submitted. You can generally expect feedback within 7 days, but there may be exceptions (e.g., a grader has her exam in a particular week).
- **If you have questions about grading homework assignments, please email the teaching assistants directly** – do NOT use the discussion board.

Discussion Board

As appropriate, the teaching assistant and instructor will regularly monitor and reply to messages on the discussion boards.

Attendance, participation, and discussions

Students may miss class for a variety of reasons. As much as possible, please stay in contact with the instructor to discuss accommodation should they be needed.

Student participation requirements

Because this is an in-person course, your attendance is based on class attendance and participation. The following is a summary of everyone's expected participation:

- **In class lectures:**
Students will be expected to attend and participate in lectures. If you have a situation that might cause you to miss an entire week of class, discuss it with me as soon as possible.
- **Logging in: AT LEAST ONCE PER WEEK**
Ensure you log in to the course in Carmen regularly, including weeks with holidays.
- **Office hours: OPTIONAL OR FLEXIBLE**
All office hours are optional. If you are required to discuss an assignment with me, or if you need time outside my scheduled office hours, please get in touch with me at the beginning of the week.

Discussion and communication guidelines

The following are expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Writing style:** Remember to write using good grammar, spelling, and punctuation. Informality (including an occasional emotion) is acceptable for non-academic topics.
- **Tone and civility:** Let's maintain a supportive learning community where everyone feels safe and can disagree amicably. Remember that sarcasm doesn't always come across online.
- **Citing your sources:** When we have academic discussions or in your projects, please cite your sources to back up what you say. List at least the title and page numbers for the textbook or other course materials. For online sources, include a link.
- **Backing up your work:** Consider composing your academic posts in a word processor, where you can save your work and then copying into the Carmen discussion.

Other course policies

Health and Safety

The Ohio State University Wexner Medical Center's Coronavirus Outbreak site (<https://wexnermedical.osu.edu/features/coronavirus>) includes the latest information about COVID-19 as well as guidance for students, faculty and staff.

Potential disruptions to instruction

- As much as possible, students will have access to material online if they cannot attend class because of a positive diagnosis, symptoms, or quarantine required following contact tracing.
- If the instructor cannot be present in person because of a positive diagnosis, symptoms, or quarantine, classes will continue online.

Student academic services

Student academic services are available on the OSU main campus: <http://advising.osu.edu/welcome.shtml>.

Student support services

Student support services are offered on the OSU main campus: <http://ssc.osu.edu>.

OSU Academic Integrity Policy

The Committee on Academic Misconduct is responsible for investigating or establishing procedures for investigating 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 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/>.

If I suspect a student has committed academic misconduct in this course, I am obligated by university rules to report my suspicions to the Committee on Academic Misconduct (COAM). If COAM determines that you have violated the university's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the university.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- Committee on Academic Misconduct web page
- Ten suggestions for preserving academic integrity (go.osu.edu/ten-suggestions)

Policies for this course

- **Exams:** You must complete the midterms and final exams yourself without external help or communication.
- **Written assignments:** Your written assignments, including discussion posts, should be your original work.
- **Reusing past work:** In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss the situation with me.
- **Falsifying research or results:** All research you will conduct in this course is intended to be a learning experience; you should never feel tempted to make your results or your library research look more successful than it was.
- **Collaboration and informal peer review:** The course includes many opportunities for formal collaboration with your classmates. While study groups and peer review of major written projects are encouraged, comparing answers on a quiz or assignment is not permitted. If you're unsure about a particular situation, please feel free to ask ahead of time.

Copyright Disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside the course.

Sexual Misconduct/Relationship Violence Statement

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 at titleix@osu.edu

Commitment to a diverse and inclusive learning environment

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 their 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.

Land Acknowledgement

We would like to acknowledge the land that The Ohio State University occupies is the ancestral and contemporary territory of the Shawnee, Potawatomi, Delaware, Miami, Peoria, Seneca, 6 Wyandotte, Ojibwe and Cherokee peoples. Specifically, the university resides on land ceded in the 1795 Treaty of Greeneville and the forced removal of tribes through the Indian Removal Act of 1830. I/We want to honor the resiliency of these tribal nations and recognize the historical contexts that have and continue to affect the Indigenous peoples of this land. More information on OSU's land acknowledgment can be found at <https://mcc.osu.edu/about-us/land-acknowledgement>

Your mental health

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 the 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

Religious accommodations

It is Ohio State's policy to reasonably accommodate the sincerely held religious beliefs and practices of all students. The policy permits a student to be absent for up to three days each academic semester for reasons of faith or religious or spiritual belief. Students planning to use religious beliefs or practice accommodations for course requirements must inform the instructor in writing no later than 14 days after the course begins. The instructor is then responsible for scheduling an alternative time and date for the course requirement, which may be before or after the original time and date of the course requirement. These alternative accommodations will remain confidential. It is the student's responsibility to ensure that all course assignments are completed Accessibility accommodations for students with disabilities.

Accessibility accommodations for students with disabilities

Requesting accommodations

The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process, managed by Student Life Disability Services. 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; <http://slds.osu.edu>; 098 Baker Hall, 113 W. 12th Avenue.

Accessibility of course technology

This course requires the use of Carmen (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

- [Carmen \(Canvas\) accessibility](#)
- Streaming audio and video
- Synchronous course tools

Disclaimer

This syllabus should be taken as a fairly reliable guide for the course content. However, you cannot claim any rights from it, and in particular, we reserve the right to change due

dates or the methods of grading and/or assessment if necessary. Any changes will be communicated to you through official course announcements.

Course schedule (tentative)

Lectures	Dates	Topics	Textbook Section
1	Jan. 07	Sampling, numerical, and graphical summaries	1.1 -1.3
2	Jan. 09	Probability rules, equally likely outcomes	3.1
3	Jan. 14	Conditional probability, independence	3.2
4	Jan. 16	Discrete RVs, probability mass functions	3.3
5	Jan. 21	Expected values, variances	3.3
6	Jan. 23	Continuous RVs, density, and distribution functions	3.3
7	Jan. 28	Means and variances of continuous RVs	3.3
8	Jan. 30, Feb. 04	Binomial distribution	4.1
9	Feb. 06	Normal distribution	4.3
10	Fe. 11	Linear comb. of normal RVs, normal probability plots	4.3, 4.7
11	Feb. 13	Central Limit Theorem	4.8
12	Feb. 18,	CI for mean (known variance)	5.1, 5.2
13	Feb, 20	t-intervals for mean (unknown variance)	5.4
*	FEB 25	EXAM 1	
14	Feb 27	Hypothesis tests for population means	6.1
15,16	Mar. 4, 6	Significance Levels, P-Value	6.2, 6.6
*	Mar. 10 – 14	SPRING BREAK	
17	Mar. 18	t-tests	6.4
18	Mar. 20	Power	6.7
19, 20	Mar. 25, 27	Two sample t-tests	7.1, 7.3

Lectures	Dates	Topics	Textbook Section
21	Apr. 01	One factor experiments, randomization, F-tests ANOVA	9.1
	APR. 03	EXAM 2	
22	Apr. 08	ANOVA	9.1
23	Apr. 10	Pairwise comparisons	9.2
24	Apr.15	Two-factor experiments, balanced vs. unbalanced	9.3
25	Apr. 17	Randomized complete block designs	9.4
26	Apr. 21	Revision	
	Apr. 28	COMPREHENSIVE FINAL EXAM	