



THE OHIO STATE UNIVERSITY

STATISTICS: 1450.01 (17946) INTRODUCTION TO THE PRACTICE OF STATISTICS AUTUMN 2021

Course Overview

Instructor & Office Hours

Keith Rodgers rodders.277@osu.edu

Mondays and Wednesdays 12 pm
– 1 pm in Cockins 212B or by
appointment

Teaching Assistant

Sara Helwig helwig.23@osu.edu

Coordinator of STAT 1450.01 & Office Hours

Laura Jones jones.5810@osu.edu

In the subject line of your email, please
include STAT 1450.01 and the section
number, 17946.

Tuesdays 7:00 pm – 8:00 pm and Fridays 1:30 pm – 2:30 pm via CarmenZoom

Additional appointments can be made if needed. If you would like to arrange a time to talk through Zoom, please reach out via email at least 24 hours in advance of the time you would like to meet.

Meeting Days/Times

Lecture: T/TH 5:20 pm – 6:15 pm in EA 160

Recitation: Wednesday at either 4:10 pm or 5:20 pm in EA 285

Course Description

Algebra-based introduction to data analysis, experimental design, sampling, probability, inference, and linear regression. The inference practices will involve confidence intervals and hypothesis tests for a population mean (both with sigma known and unknown) and a population proportion, the difference between 2 population means and 2 population proportions, paired data, and the Chi-square test of independence. Emphasis will be put on applications, statistical reasoning, and data analysis using statistical software. This 3-credit hour course expects all students to have completed a baccalaureate-level mathematics course.

Your Support System

1450.01 Coordinator Professor Jones keeps all STAT 1450.01 students abreast of updates and important developments with the course along with managing the overall course structure with instructional resources and lecture presentations.

Instructor Provides the overarching view of clusters of concepts

Teaching Assistants The TAs will use weekly recitations to reinforce and extend content covered in lecture. Students are expected to be active participants in these sessions.

Tutors The TAs, instructor, and Professor Jones will provide support through office hours. Although you are assigned a specific TA for recitation, you are welcome to attend any of the scheduled office hours for STAT 1450.01.

The Statistics Department (Cockins 404) does keep a list of private tutors if necessary. Students currently enrolled in a statistics course offered by the Ohio State Department of Statistics may contact Jean Scott, Statistics Program Coordinator, about hiring a private tutor. She can be reached at 614-688-5913 or scott.961@osu.edu.

Primary Course Goal:

- To develop skills in drawing conclusions & critically evaluating results based on data

Course Objectives:

- To introduce you to correct data collection methods through random sampling, experimental design & surveys
- To enable you to use statistical tools for presentation and descriptions of data
- To enable you to understand basic probability rules and sampling distributions as the foundation of inference
- To enable you to analyze data through linear regression, confidence intervals, and hypothesis tests

- To enable you to evaluate statistical procedures in the context of assumptions, biases, and extrapolation.

Course Learning Outcomes

This course satisfies the General Education requirement in Data Analysis.

By the end of this course, students should successfully be able to:

- Understand basic concepts of statistics and probability.
- Comprehend methods needed to analyze and critically evaluate statistical arguments.
- Recognize the importance of statistical ideas.

Professor Jones's Vision for Your Completion of STAT 1450.01

- You will become proficient in collecting, organizing, analyzing, and interpreting data
- You will become competent in the use of data analysis software.
- You will interpret findings and improve in your ability to justify your results.
- Your metacognition and desire to reflect upon what you have learned will be heightened.
- You will respond to a problem by: considering any relevant assumptions, analyzing, and effectively communicating your results.
- You will gain a greater appreciation for statistics (and the mathematics that underpins our work)
- You will complete the Data Analysis General Education (GE) requirement.

Personal Vision Statement & Commitment

<p>Personal <u>Vision Statement</u> for STAT 1450.01:</p> <p>By successfully completing STAT 1450.01, I will:</p> <ul style="list-style-type: none"> • • • 	<p>Personal <u>Commitment</u> to STAT 1450.01:</p> <p>To successfully complete STAT 1450.01, I must:</p> <ul style="list-style-type: none"> • • •
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Course Materials

Required Course Materials

The textbook and courseware for this course is being provided via CarmenBooks. Through CarmenBooks, students obtain publisher materials electronically through CarmenCanvas, saving them up to 80% per title. The fee for our material is included as part of tuition and is listed as CarmenBooks fee on your Statement of Account. In addition to cost-savings, materials provided through CarmenBooks are available immediately on or before the first day of class. There is no need to wait for financial aid or scholarship money to purchase your textbook.

Unless you choose to opt-out of the program, you do NOT need to purchase any materials for this course at the bookstore. For more information on the program or information on how to opt out, please visit the [CarmenBooks website](#).

CarmenBooks will include an e-book of the textbook (The Basic Practice of Statistics, 9th ed. by Moore, Notz, and Fligner) along with access to Achieve (our online quiz and homework system). In addition to the e-book, if you would like a hard copy of the textbook, please visit the OSU Bookstore: <https://tinyurl.com/W21-STAT-145002-32810>

STUDENT REGISTRATION INSTRUCTIONS

- Log into STAT 1450.01 through Carmen.
- Click on “MacMillan Higher Education” in the left navigation panel.
- Click the Achieve link (note: if you encounter an error message or blank screen, you will need to adjust your browser settings and/or disable pop-up blockers).
- Agree to Macmillan Learning terms of use and end user agreement.
- Click on any Achieve assignment link to launch the assignment. Follow the associated steps and continue to your assignment page.
- You are now enrolled in the course and can access future assignments through the Carmen links.
- To access your e-book, select the textbook graphic on the far left of the Achieve homepage.
- **Need Help?** The technical support team can be reached by phone, chat, or by email via the Student Support Community. To contact support please open a service request by filling out the webform:
<https://macmillan.force.com/macmillanlearning/s/contactsupport>

Top Hat

We will use the *Top Hat* software to elicit student responses during lectures. Students will use their smart phones to text responses to questions posed. You may download the Top Hat app or use the direct link below. Your username must be your name.# (e.g., carter.5).

Top Hat course name: **STAT 1450.01 AU 21**

Direct Link: <https://app.tophat.com/e/978381>

6-digit course code: **978381**

Required Supplemental Materials

JMP is the statistical software for this course. JMP is free.

Click on www.jmp.com/macmillan .

Enter SE146414253X as the 12-digit authorization code.

Proceed to download and install JMP-Student Edition.

OR

Request it through the university at <https://ocio.osu.edu/software/directory/slwin>

Highly Recommended Materials

Texas Instruments 84 (or higher) Graphing Calculator. Note that at least a basic calculator is required.

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 24/7.

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

Technology Skills Necessary for this Specific Course

- CarmenZoom text, audio, webcam, and screen share. If you need technical assistance, either call 614-688-HELP, or refer to the online instructions: <https://resourcecenter.odee.osu.edu/carmenzoom>
- Use of *Achieve*, which you must purchase (see above). If you need technical assistance, either call tech support at 1-800-936-6899 or fill out the form located at <https://macmillan.force.com/macmillanlearning/s/contactsupport>

Necessary Equipment

- Computer: current Mac or PC
 - Mac minimum requirements for JMP: OSX 10.6 or later, 1GB RAM, 500MB free hard disk space
 - PC minimum requirements for JMP: Pentium 4 or higher, Windows XP or later (Home Basic Editions **not** supported), 1GB RAM, 500MB free hard disk space, and True (24bit+) color with resolution 1024x768 or greater
 - **Internet Browser: Chrome**
- Robust high-speed internet connection
- Webcam: built-in or external webcam, fully installed
- Microphone: built-in laptop or tablet mic or external microphone
- [Microsoft Office 365 ProPlus](#) All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. Each student can install Office on five PCs or Macs, five tablets (Windows, iPad® and Android™) and five phones.

- Students are able to access Word, Excel, PowerPoint, Outlook and other programs, depending on platform. Users will also receive 1 TB of OneDrive for Business storage.
- Office 365 is installed within your BuckeyeMail account. Full instructions for downloading and installation can be found <https://ocio.osu.edu/kb04733>.

Grading

Grades – The following is the ONLY credit that will be offered. Please refrain from asking for additional work as a means to boost your grade. This is unfair to offer to 1 student and is impractical to offer to the whole class.

Assignment or Category	Percentage
Exam 1 (Mon, October 4 th , 6:00 pm – 7:00 pm through CarmenZoom)	20%
Exam 2 (Mon, November 8 th , 6:00 pm – 7:00 pm through CarmenZoom)	20%
Final Exam (Mon, December 13 th , 6:00 pm – 8:00 pm through CarmenZoom)	20%
Participation in Learning Environment (7% Recitation Activities, 2% Recitation Surveys, and 5% Lecture Participation)	14%
Homework Assignments (11 total, 1.67% each, 2 are dropped)	16%
Quizzes (7 total, 1.67% each, 1 is dropped)	10%
Extra Credit – LearningCurve via Achieve (+0.105% for each Chapter # LearningCurve completed by meeting the target score)	2%
Total	102

Recitation Activities: Weekly recitation activities (**due on Wednesdays**) are your first attempt at the material and therefore are **graded based upon completion and good faith effort**. Do your best while working through them. It is an opportunity to begin to think through the material in a group setting. **They will be due at the conclusion of your scheduled recitation time.**

Recitation Surveys: For each recitation activity, there will be a corresponding participation survey. These surveys are meant to gauge your comfortability with the content and the effectiveness of your group work. **They will be due by 11:59 pm the day after your scheduled recitation.**

Homework Assignments: Weekly homework assignments (**due Fridays**) are a chance for you to further explore the material, so they have **unlimited attempts**. As long as you do not give up on the problem, you can **attempt it as many times as you would like without penalty**.

Quizzes: Quizzes (**due roughly every other Monday**) have **1 attempt per question with a 1 hour and 30-minute time limit**. You can reference your notes, the textbook, or any other Achieve resources. Unlike homework assignments, you should feel confident with the material before taking the quiz.

Late Submissions: **NO LATE WORK IS ACCEPTED.** For extenuating circumstances, please contact Professor Jones (jones.5810@osu.edu) **BEFORE** the assignment deadline. To compensate for this, multiple dropped assignments are worked into the system. They include: the lowest 2 homework assignments, the lowest quiz score, and the lowest 2 recitation scores (1 for each half of the semester).

The exact due dates for the above assignments are on the course calendar that is included at the end of this document and on the Carmen Homepage.

Exams

All course exams will be taken through Carmen, and they will be proctored via CarmenZoom. The requirements for the duration of the exam will be to:

- Use the Chrome browser
- Share your webcam
- Share your screen

At least a week prior to the scheduled exam, you will be provided with a CarmenZoom meeting link and passcode. Please do not share this information with other students since their assigned meeting space may be different.

Please enter the CarmenZoom meeting space by 5:50 pm so that the proctor has time to place each student in a breakout room. This will ensure the exam can begin promptly at 6 pm.

If you have a direct conflict with an exam, you must contact Professor Jones **at least 1 week in advance of the scheduled exam time**. Requests received after this may receive a grade deduction.

The format of all exams may include multiple choice, fill-in-the blank, and short answer questions. To receive full credit, you must show appropriate work on the short answer questions including formulas and graphing calculator functions with inputs.

Exam 1: The duration of the exam will be 1 hour. It will cover Chapters 1-6, 8, and 9.

Exam 2: The duration of the exam will be 1 hour. It will cover Chapters 12, 13, 15-18, and 20.

Final Exam: The duration of the exam will be 2 hours. It will be cumulative, but there will be an emphasis on the content you have not been tested on (ie Chapters 21-23, and 25).

Make-up exams will only be offered to those with extenuating circumstances if requests are received in a timely manner. **The exam must be taken within 3 days of the scheduled exam date.**

Course Registration and Completion

Students should work with department staff on any ADD and SECTION changes. Students should contact Jean Scott (Cockins Hall 408A jscott@stat.osu.edu).

Date	Event
Friday, August 27 th	The last day to add a course without instructor's permission.
Friday, August 27 th	The last day to drop a class and receive a full refund.
	<i>*Please note that students who are dropped for non-payment are not guaranteed re-enrollment.*</i>
Friday, September 3 rd	The last day to drop without a 'W' appearing on your record.
Friday, September 3 rd	The last day to register for pass/non-pass or audit options.

Grading Scale

93–100: A
 90–92.9: A-
 87–89.9: B+
 83–86.9: B
 80–82.9: B-
 77–79.9: C+
 73–76.9: C
 70–72.9: C-
 67–69.9: D+
 60–66.9: D
 Below 60: E

Faculty Response

Instructor Feedback and Response Time

Grading and Feedback

Exam grades will be available within **7 days**.

E-mail

All course e-mail correspondence must be done through a valid OSU name.# account. Expect a 24-hour response time when communicating with TAs and Professor Jones (jones.5810@osu.edu). We are here to support you, but just not quite in a true “on-demand” sense.

Additional Policies, Resources, & Information

Student Participation and Responsibility

We expect you to be actively engaged in the learning process. You are responsible for your learning. Schedule a minimum of 6 hours to prepare for this course. This equates to 9 hours weekly when the 3 hours for lecture and recitation attendance are included. Successful students perform a variety of positive academic behaviors like: referencing the Carmen page, downloading notes, reviewing notes before recitation, being proactive in contacting a TA or classmate as necessary, etc... Please seek assistance in managing any non-academic responsibilities prior to any potential for under-performance.

Accommodations for Extenuating Circumstances

Opportunities to Complete Assessments Beyond Initial Due Dates

The established windows of availability provide ample opportunity for administration and submission of all assessments. The inability to take any assessment must be supported with legitimate 3rd party documentation and the **request must be received before a deadline passes**.

Grade Appeals

The TA and I will be fair in evaluating your work. If you believe there is a discrepancy, then please describe the situation in writing and submit to both of us for review.

Electronic Devices

As a courtesy to fellow classmates, all cellular phones and other electronic devices must be silenced during lectures and recitations. Your engagement with the class will require an attentiveness for note-taking. If necessary, TAs and instructors can request that students place these devices out of plain view if their usage is deemed irrelevant to instruction.

Academic Integrity Policy

Policies for this Online Course

- **Quizzes and exams:** You must complete the exams yourself, without any external help or communication. Biweekly quizzes should also be completed on your own, but you do have the option to reference our course materials.
- **Homework and recitations:** For these assignments, feel free to discuss ideas with others but make sure you are turning in your own work.

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/>.

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's *Code of Student Conduct* is never considered an "excuse" for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct. <http://studentlife.osu.edu/csc/>.

If I suspect that 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. 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. In short, if you are considering doing something that might be unethical, then resist and refrain from pursuing it. This will help you in college and well-beyond.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me. Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages ([COAM Home](#))
- *Ten Suggestions for Preserving Academic Integrity* ([Ten Suggestions](#))
- *Eight Cardinal Rules of Academic Integrity* (www.northwestern.edu/uacc/8cards.htm)

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 of the course.

Accessibility Accommodations for Students with Disabilities

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; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Accessibility of Course Technology

This online course requires 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 me.

- Carmen Canvas
- Streaming audio and video
- Synchronous course tools

Student Academic Services

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

Student Support Services

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

Other Student Resources

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](tel: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](tel: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.

Statement on Title IX

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

Diversity

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.

COVID Health and Safety Requirements

All students, faculty, and staff are required to comply with and stay up-to-date on all university safety and health guidance (<https://safeandhealthy.osu.edu>), which includes wearing a face mask in any indoor space and maintaining a safe physical distance at all times. Students are to complete daily health checks and to self-isolate if running a fever or are symptomatic in other ways. Non-compliance will be warned first and disciplinary actions will be taken for repeated offenses.

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.

Disclaimer

This syllabus should be taken as a 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.

Autumn 2021 STAT 1450.01 Calendar

Date & Time		Location	Assessment
Monday, October 4 th	6:00 pm – 7:00 pm	CarmenZoom	Exam 1
Monday, November 8 th	6:00 pm – 7:00 pm	CarmenZoom	Exam 2
Monday, December 13 th	6:00 pm – 8:00 pm	CarmenZoom	Final Exam
<i>Tuesdays</i>		<i>Thursdays</i>	
August 24 Ch.1 Picturing Distributions with Graphs		August 26 Ch. 2 Describing Distributions with Numbers (thru 2.4)	
August 31 Ch. 2 Describing Distributions with Numbers		September 2 <u>HW 1 Due F 9/3</u> <u>Qz 1 Due T 9/7</u> Ch. 3 The Normal Distribution (thru 3.4)	
September 7 Ch. 3 The Normal Distribution		September 9 <u>HW 2 Due F 9/10</u> Ch. 4 Scatterplots & Correlation	
September 14 Ch. 5 Regression (thru 5.2)		September 16 <u>HW 3 Due F 9/17</u> <u>Qz 2 Due M 9/20</u> Ch. 5 Regression	
September 21 Ch. 6 Two-Way Tables		September 23 <u>HW 4 Due F 9/24</u> Ch. 8 Producing Data: Sampling	
September 28 Ch. 9 Producing Data: Experiments		September 30 <u>Qz 3 Due F 10/1</u> Ch. 12 Introducing Probability Exam 1 Review <i>Covering Chapters 1-6, 8, & 9 (held outside of class)</i>	
October 5 Ch. 13 General Rules of Probability		October 7 <u>HW 5 Due 10/8</u> Ch. 13 General Rules of Probability	
October 12 Ch.15 Sampling Distributions		October 14 <u>HW 6 Due M 10/18</u> <u>Qz 4 Due M 10/18</u> Fall Break – No Lecture	
October 19 Ch. 16 Confidence Intervals: The Basics(thru16.2)		October 21 <u>HW 7 Due F 10/22</u> Ch. 16 Confidence Intervals: The Basics Ch. 17 Tests of Significance: The Basics (thru 17.2)	
October 26 Ch. 17 Tests of Significance: The Basics Ch.18: Inference in Practice		October 28 <u>HW 8 Due F 10/29</u> <u>Qz 5 Due M 11/1</u> Ch. 20 Inference about a Population Mean (thru 20.4)	
November 2 Ch. 20 Inference about a Population Mean		November 4 Ch. 21 Two Means (thru 21.3) Exam 2 Review <i>Covering Chapters 12,13,15,16-20 (held outside of class)</i>	
November 9 Ch. 21 Two Means		November 11 <u>HW 9 Due F 11/12</u> Veterans Day – No Lecture	
November 16 Ch.22 Inference about a Pop. Proportion (thru 22.3)		November 18 <u>HW 10 Due F 11/19</u> <u>Qz 6 Due M 11/22</u> Ch. 22 Inference about a Pop. Proportion	
November 23 Ch. 23 Comparing Two Proportions (thru 23.3)		November 25 Thanksgiving Day – No Lecture	
November 30 Ch. 23 Comparing Two Proportions		December 2 Ch. 25 Two Categorical Variables (thru 25.3)	

December 7 Ch. 25 Two Categorical Variables Review for a cumulative final exam	<u>HW 11 Due W 12/8 Qz 7 Due TH 12/9</u> LearningCurve Activities Due Sun 12/12 Final Exam Review – TBD Final Exam – Mon, Dec 13th at 6 pm
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*Homework assignments are typically due on Fridays and quizzes on Mondays. Assignments due at the scheduled times are indicated in red. Green indicates a deviation from this schedule.