



THE OHIO STATE UNIVERSITY

SYLLABUS:

STAT 3470– INTRODUCTION TO PROBABILITY AND STATISTICS FOR ENGINEERS

(ONLINE)

Course overview

Instructor:

Daryl Swartzentruber (swartzentruber.20@osu.edu)

Virtual office hours: Monday 1:00-2:00 PM, Wednesday 8:30-9:30 AM

Office hours will be held on CarmenZoom. The link is below. In general, office hours will consist of a group meeting where I answer student questions in turn. If you would like to have a private conversation with me during office hours, you must email me ahead of time and I can give you a few minutes at the beginning or end of the time. This is not meant for private tutoring but rather to discuss confidential information such as accommodations and family emergencies. Due to the size of the class I am unable to have office hours by appointment, but if you cannot make the office hours you can email me or post a question on the discussion board.

Group homework sessions: Friday 10:30-11:30

These will be similar to office hours, but with two main differences. One, the focus will be on homework problems rather than lecture examples, TopHat problems, etc. Two, I will record these sessions and post them on Carmen, so that students who cannot make office hours can go back and watch them to get homework help. The link is the same as for the general office hours.

Zoom Link:

<https://osu.zoom.us/j/99455425785?pwd=dUxNbE1LMTZWODY3Sm9FZDdKTk1adz09>

Meeting ID: 994 5542 5785

Password: 618834

Teaching Assistants (TA):

Following is the list of teaching assistants assigned for this course:

- i) Chakraborty.Poulami (chakraborty.121@osu.edu)
- ii) Zhao.Zhizhen(zhao.3053@osu.edu)
- iii) Lu.WeiEn (lu.1408@osu.edu)
- iv) Fu.Xiaohan (fu.688@osu.edu)
- v) Ruttenberg.David (ruttenberg.6@osu.edu)
- vi) Kaur.Pashmeen (kaur.138@osu.edu)
- vii) Hopper.Gregory (hopper.129@osu.edu)

Teaching assistants will have their Tutor hours through MSLC (<https://mslc.osu.edu/>). Tutor hours for each TA will be declared soon and posted on Carmen. Students are encouraged to check the MSLC website for details about joining tutor hours.

Course description

This 3 credit hour course is an introduction to probability and statistics for engineers. Topics covered include probability, Bayes Theorem, discrete and continuous random variables, probability distributions, expected values, sampling distributions, point estimation, confidence intervals, hypothesis testing and least squares regression models. A more detailed list of topics can be found in the tentative schedule below.

Prerequisites

MATH 1152, 1161.xx, 1172, 1181H, 153, or 254, or equivalent.

Course learning outcomes

General Education (GE) Requirement: This course satisfies the GE requirement in Data Analysis.

Expected Learning Outcomes: Upon successful completion of this course, students understand basic concepts of statistics and probability, comprehend methods needed to analyze and critically evaluate statistical arguments, and recognize the importance of statistical ideas.

Required Course Materials

Probability and Statistics for Engineering and the Sciences (9th edition), by Jay Devore and access to the accompanying homework management system **WebAssign**. The electronic version of this textbook and WebAssign are offered through CarmenBooks.

<https://affordablelearning.osu.edu/carmenbooks/students> Instructions for accessing this course's WebAssign page will be posted on CarmenCanvas. The course instructor and graders will have access to data collected by WebAssign, including all recorded homework solution attempts.

Students are also required to register with **TopHat**, which is free for Ohio State University students. Please go to the TopHat home page (<https://tophat.com/>) and either login (<https://app.tophat.com/login>) or signup for an account (<https://app.tophat.com/register/>), which is free for students at The Ohio State University. Make sure you are using the latest version of the app or are accessing it through a browser. TopHat is already connected to the CarmenCanvas course, so you should not need a join code. Instead it should be listed as one of your courses when you sign in or you can search for STAT 3470: 32759 (SP 21). Please contact the instructor if you have difficulty accessing the course TopHat content.

Online Course Delivery

Instructions, materials (including links to lecture videos), assignments, announcements and other information will be posted to the course CarmenCanvas site. Students are expected to watch lecture videos, read textbook sections and study other materials as assigned each week. Students are also required to respond to questions housed in TopHat and homework/quizzes in Webassign. Students should attend virtual office hours via CarmenZoom as needed or desired.

Students are asked to use the CarmenCanvas discussion boards to ask questions or otherwise discuss topics relevant to this course. These are not required and will not be graded. However, students are expected to use these boards to ask any content questions rather than emailing the instructor. For each chapter there will be separate boards dedicated to homework problems, TopHat problems, and lecture/general questions. Students are encouraged to answer each other's questions and to read the questions in the board before posting a new one in case their question has already been answered.

Students are expected to check the CarmenCanvas course site regularly, and are encouraged to customize CarmanCanvas notifications to stay abreast of course announcements and activities (<https://resourcecenter.odee.osu.edu/carmencanvas/setting-notification-preferences>). In particular, important communication in the course will be done through Carmen announcements. Students are responsible for any information that is included in the announcements, so they are expected to read those fully.

Assessment

TopHat (5% of the overall grade): Students should answer all TopHat questions that are posted along with the video and reading assignments in CarmenCanvas. You have a total of 3 attempts on each question. These problems will be graded for accuracy. However, a video explaining the solutions to the TopHat problems will be posted each week along with the problems. Therefore, students are encouraged to try to answer the problem themselves on the first two attempts, and if those are not correct to watch the video and then enter the correct answer in order to get full credit for the TopHat grade. Students are allowed to work together on these problems. These will typically be due on Mondays at 5:00 PM for the previous week's module, but the exact due dates will be given in Carmen. No credit will be given for late submissions, and no extensions will be given except in emergency situations.

Homework (20%): Graded homework problems will be assigned almost every week and typically due on Mondays, with some exceptions related to exams and university holidays. Students must submit solutions to these assignments online, through the WebAssign interface. These will typically be due on Mondays at 5:00 PM. Students will typically be given 3 attempts on each question. Students are encouraged to work together (via CarmenZoom or other preferred mechanism) to understand course concepts, but students must only submit their own work to WebAssign. Students are also encouraged to seek help from the discussion boards, instructor office hours, and the MSLC tutoring center for these problems. Scores on the homeworks will be rounded up to the next highest 10 percentage points (i.e. 81.2 becomes 90, 99.2 becomes 100). The lowest homework score will be dropped. No credit will be given for late submissions, and no extensions will be given except in emergency situations.

Quizzes (15%): Quizzes will be assigned almost every week, with some exceptions related to exams and university holidays. Students must submit solutions to these assignments online, through the WebAssign interface. These will typically be due on Mondays at 5:00 PM. Students will only have one attempt per question. There will be a time limit of one hour for each quiz. Students may not work together or ask for help in office hours or MSLC tutoring for the quiz problems. The scores will not be rounded up like the homework scores are. The lowest quiz score will be dropped. No credit will be given for late submissions, and no extensions will be given except in emergency situations.

Exams (17.5% for each of two midterms, 25% for the final): There will be two midterm exams and one final exam. Each exam contains both multiple choice and short answer questions. The multiple choice questions will be submitted via a Carmen quiz. The short answer questions will be available as pdfs within a Carmen quiz. Students will download each question, answer them either electronically or on paper, and then upload a pdf to a separate Carmen assignment. Students may refer to their textbook, course notes, and course sites (CarmenCanvas, WebAssign and TopHat) during both exam components. However, students may not work with other people or use outside resources (including third party websites or tutoring services) to create new notes for use during the exam or communicate with any person other than the

course instructor about any aspect of the exam until the exam scores have been posted. See the course policy on academic integrity for more details.

Each midterm exam will have one primary time window, which will be in the evening. The final exam will have two primary time windows, one in the evening and one in the morning. If you have a direct conflict between these exam times and another academic or university requirement, you can email me with the details of the conflict and if approved, you can take the exam at a different time that will be scheduled later. The midterm exams will consist of 30 minutes to answer the multiple choice problems and download the short answer problems, followed by 40 minutes to answer the short answer problems, for a total of 1 hour and 10 minutes. This will be followed by a 30 minute upload window. The final exam will consist of 40 minutes to answer the multiple choice problems and download the short answer problems, followed by 60 minutes to answer the short answer problems, for a total of 1 hour and 40 minutes. This will also be followed by a 30 minute upload window. Students with extended time will receive this extension on the working time but not the upload time. The times below include the upload windows.

The dates/times for the exams are:

Midterm 1: Thursday, February 18; 7:00-8:40 PM

Midterm 2: Monday, March 29; 7:00-8:40 PM

Final Exam: Monday, April 26; 7:00-9:10 PM or Tuesday, April 27; 9:00-11:10 AM

Final grades in the course will be determined based on the following scale, and based on the percentage of total points that you earn during the semester. If a curve or grade adjustment is applied, it will be communicated to the students. No extra credit will be given.

Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	E
Min %	93	90	87	83	80	77	73	70	67	60	0

Course schedule

The following is a tentative weekly list of topics that will be covered during this course

Week	Topic	Textbook Reading
1	Sample spaces and events, axioms and properties of probability, counting techniques, conditional probability	1.1-1.4, 2.1-2.4
2	Bayes' theorem and independence, discrete random variables, probability distributions, expectation and variance of (functions of) random variables	2.5, 3.1-3.3

3	Binomial, Poisson probability distributions, continuous random variables, density and distribution functions	3.4, 3.6. 4.1
4	Percentiles and expected values, the Normal, exponential, and Gamma distributions, joint probability distributions	4.2-4.4, 5.1
5	Conditional distributions, conditional expectation, covariance and correlation, sampling distribution of a statistic, distribution of the sample mean and central limit theorem	5.2-5.4
6	Combinations of random variables	5.5
7	Populations and parameters, samples and statistics, concepts of estimation and inference	6.1-6.2
8	Point estimation, including method of moments and maximum likelihood, confidence intervals	7.1
9	Large sample intervals for means and proportions, confidence intervals for means of normal populations, hypotheses and testing procedures	7.2-7.3, 8.1
10	Hypothesis testing, tests for population means and proportions	8.2-8.4
11	Goodness of fit tests	14.1
12	Correlation	12.5
13	Simple linear regression, estimation and inference	12.1-12.3
14	Simple linear regression, model checking, transformations	12.4, 13.1-13.2
15	Multiple regression	13.4

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>, 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 courses

- 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/> .
- Navigating WebAssign; the following website may help you if you encounter difficulties with WebAssign: <http://support.cengage.com/>. Only Cengage support personnel can assist you with linking your WebAssign account to the WebAssign course.
- Navigating TopHat: the following website may help you if you encounter difficulties with TopHat: <https://tophat.com/students/>.
- Watching lecture videos on mediasite. Individual videos are linked on Carmen, but the link for the channel containing all the videos is:
<https://mediasite.osu.edu/Mediasite/Channel/a8ce9969b05a4b71afe3835ac5f913705f>

Necessary equipment

- Computer: current Mac (macOS) or PC (Windows 10+) with high-speed internet connection and an up-to-date browser. A number of publicly available computers are available on campus, here is a link for their locations <https://odee.osu.edu/public-computing> .
- CarmenZoom text, audio, and video chat. If you need technical assistance, either call 614-688-HELP, or refer to the online instructions: <https://resourcecenter.odee.osu.edu/carmenzoom>

Staff response

Staff 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** at any time if you have a technical problem.)

Email

A course instructor or teaching assistant will check and reply to email within **48 hours on school days (Monday – Friday, excluding university holidays; list of holidays at <http://registrar.osu.edu/staff/bigcal.asp>)**. Due to privacy law, the course instructor and teaching assistants will only respond to email sent from **official Ohio State University addresses**, such as your name.#@buckeyemail.osu.edu address.

Discussion board

A course instructor or teaching assistant will check and reply to messages in the discussion boards as appropriate every **48 hours on school days**.

Attendance, participation, and discussions

Communication guidelines

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

- **Writing style:** While there is no need to communicate as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. Informality (including an occasional emoticon) is fine for non-academic topics.
- **Tone and civility:** Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online.
- **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

Academic integrity policy

Policies for this online course

- **Assessments:** You must complete the assessments (exams and quizzes) yourself, without any external help or communication. More details are included in the assessment section of this syllabus.

Ohio State's academic integrity policy

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

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.

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.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact the instructor.

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

- The Committee on Academic Misconduct web pages (<http://oaa.osu.edu/coam.html>)
- *Ten Suggestions for Preserving Academic Integrity* (<https://oaa.osu.edu/coamtensuggestions.html>)
- *Eight Cardinal Rules of Academic Integrity* (<http://www.northwestern.edu/uacc/8cards.htm>)

Advising

For help navigating this large university, you will find that you need advising. In addition, advisors can help you get information regarding accessing course materials to meet the needs of diverse learners. For more information, visit the university's advising website at <https://advising.osu.edu/>. In addition to advising services, OSU main campus students may find assistance at <http://ssc.osu.edu>.

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.

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

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 your instructor.

- Carmen (Canvas) accessibility (<https://community.canvaslms.com/docs/DOC-2061>)
- Streaming audio and video
- WebAssign
- TopHat

Mental health statement

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.