



THE OHIO STATE UNIVERSITY

SYLLABUS:

STAT 3470– INTRODUCTION TO PROBABILITY AND STATISTICS FOR ENGINEERS (ONLINE)

Course overview

Instructor:

This course is being taught by two instructors, who will be acting as co-instructors through the semester:

- 1) Daryl Swartzentruber (swartzentruber.20@osu.edu)
- 2) Amartya Ghosh (ghosh.147@osu.edu)

Office hours: Days and times TBD, or by appointment. Office hours will be held on CarmenZoom (<https://osu.zoom.us>)

Teaching Assistants (TA):

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

- i) Yu.Haozhen (yu.2823@osu.edu)
- ii) Zhao.Zhizhen(zhao.3053@osu.edu)
- iii) Lu.WeiEn (lu.1408@osu.edu)
- iv) Yu.Yue (yu.2063@osu.edu)
- v) Li.Jingjing (li.7586@osu.edu)

Teaching assistants will have their Tutor hours through MSLC. Tutor hours for each TA will be declared soon. 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. TopHat is already connected to the

CarmenCanvas course page, so you should not need a join code. 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 required to use the CarmenCanvas discussion boards to ask questions or otherwise discuss topics relevant to this course, as detailed below. Students are also required to respond to questions and polls housed in TopHat. Students should attend virtual office hours via CarmenZoom as needed or desired.

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>).

Assessment

Course Participation: Students should participate in all TopHat quiz and poll questions that are posted along with the video and reading assignments in CarmenCanvas. Each question counts equally toward the final course grade, and are marked only for completion. Students should regularly contribute to the discussion of course topics via CarmenCanvas discussion boards. Each chapter has two discussion boards in CarmenCanvas, one for homework and TopHat questions, and one for general discussion. This makes a total of 18 discussion boards. Students will receive full discussion participation credit if they post either a new topic or responding to an existing topic in at least ten of these boards during the time the course is focused on that section.

Homework: Graded homework problems will be due weekly, with some exceptions related to exams and university holidays. Students must submit solutions to these assignments online, through the WebAssign interface. Students will typically have 5-7 days between the assignment of relevant course activities and graded homework due dates. Depending on the length and degree of difficulty of the homeworks, some may have little more time. The instructors will make an announcement through Carmen, whenever a homework is posted. Please note that is the student's responsibility to go through the announcements and be aware of the due dates for the homeworks. For this purpose, it is advised that students adjust the Carmen notification settings accordingly to get timely notifications about course announcements and activities. 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.

Exams: There will be two midterm exams and one final exam. Each exam has two components. The first consists of questions to be answered via multiple choice and/or short-answer within the CarmenCanvas quiz system. Students may begin the quiz any time during the announced 4-hour window, but must submit their responses within a specified amount of time after beginning the quiz. The second component consists of questions to be answered via longer responses, including calculations. Students may begin the long answer component any time during the announced 24-hour window, but must upload clearly legible written answers within a specified time after beginning the long answer portion. Answers should be submitted via a .pdf file created by the student. Students may refer to their textbook, notes, and course sites (CarmenCanvas, WebAssign and TopHat) during both exam components. However, during an exam embargo period consisting of the 4- and 24-hour windows and any additional time announced by the instructor, 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. This embargo includes providing or seeking any information about the exam, including perceived exam difficulty and exam format, such as number of questions. Please contact the instructor as soon as possible if you believe the embargo may have been breached. See the course policy on academic integrity for more details.

Participation will count for 5% of the final grade, homework will count for 15%, each midterm exam will count for 25% and the final exam will count for 30% of the final grade.

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.

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

Late homework assignments are not accepted without arrangements agreed upon prior to the due date or documented emergency. Extension requests after the due date will not be entertained except for an emergency. Exams may not be taken outside the announced 24-hour window without arrangements agreed upon prior to the start of the 24-hour period or documented emergency. Students wishing to make alternative arrangements should contact the instructor as soon as possible. Students experiencing an emergency should contact the instructor as soon as reasonably possible.

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	3.4, 3.6
4	Continuous random variables, density and distribution functions, percentiles and expected values, the Normal distribution	4.1-4.3
5	Exponential, Gamma distributions, joint probability distributions, conditional distributions, conditional expectation, covariance and correlation	4.4, 5.1-5.2
6	Sampling distribution of a statistic, distribution of the sample mean and central limit theorem	5.3-5.5
7	Populations and parameters, samples and statistics, concepts of estimation and inference	6.1
8	Point estimation, including method of moments and maximum likelihood	6.2
9	Confidence intervals, large sample intervals for means and proportions	7.1-7.2
10	Confidence intervals for means of normal populations, hypotheses and testing procedures	7.3, 8.1
11	Hypothesis testing, tests for population means and proportions	8.2-8.4
12	Goodness of fit tests, simple linear regression	14.1, 12.1
13	Simple linear regression, estimation and inference	12.2-12.4
14	Simple linear regression, model checking, transformations	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/>.

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.)

Canvas Conversations

A course instructor or teaching assistant will reply to messages sent via CarmenCanvas Conversations or email within **48 hours on school days (Monday – Friday, excluding university holidays; list of holidays at <http://registrar.osu.edu/staff/bigcal.asp>)**. (In case if a reply is not received through CarmenCanvas within 48hours, it is advisable to email the instructors through buckeyemail.)

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**.

Email

A course instructor or teaching assistant will check and reply to email within **48 hours on school days**. 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.

WebAssign messages:

Students are advised not to send messages regarding homeworks through WebAssign messages. Any questions about homeworks should be asked through discussion boards or emails. Instructions about asking doubts will be provided. Questions asked through WebAssign messages will not be answered.

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 yourself, without any external help or communication. More details are included in the assessment section of this syllabus.
- **Participation:** You must create submissions to TopHat questions/polls and CarmenCanvas discussion boards yourself. You must not engage in disruptive conduct.

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

Students with disabilities (including mental health, chronic or temporary medical conditions) that have been certified by the Office of Student Life Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The

Office of Student Life Disability Services is located in 098 Baker Hall, 113 W. 12th Avenue; telephone 614- 292-3307, slds@osu.edu; slds.osu.edu.

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.