



THE OHIO STATE UNIVERSITY

STAT 3470.02

Introduction to Probability and Statistics for Engineers (25208)

Autumn 2026

Syllabus - Instructor Information

Jillian Morrison

Professional Qualifications

Ph.D., Statistical Science, Washington State University

Master's, Computational Finance, Washington State University

Bachelor's, Mathematics, University of Belize

Associate, Mathematics and Physics, St. John's College

Syllabus - Required or Recommended Readings

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. The eBook, and homework assignments are all located within this resource.

<https://affordablelearning.osu.edu/carmenbooks/students> Instructions for accessing this course's WebAssign page will be posted on Carmen. The course

instructors and graders will have access to data collected by WebAssign, including all recorded homework solution attempts.

Syllabus - Course Schedule

Week	Topic to be covered
1	Sample spaces and events
	Axioms and properties of probability
2	Counting techniques Conditional probability-
	Law of total probability, Independence
	Discrete Random Variable (RV)
3	Probability distribution-discrete
	Expectation and variance-discrete RV
	Labor day - September 7
4	Binomial distribution
	Poisson and Negative binomial distributions
	Continuous random variables- density and distribution functions
5	Percentiles and expected values- continuous RV
	Normal distribution
	Exponential, Gamma distributions
6	Joint probability distributions
	Conditional distributions
	conditional expectation
7	Covariance and correlation
	Sampling distribution of a statistic
8	distribution of the sample means and central limit theorem.
	concepts of estimation and inference
	Autumn Break - October 15-16

9	Point Estimation
	Method of moments-point estimation
	Maximum likelihood-point estimation
10	Confidence Intervals
	Large sample intervals for means.
	Large sample intervals for proportions.
11	Confidence intervals for means of normal populations.
	Hypothesis testing procedure.
	Hypothesis testing procedure-population mean
12	p-value approach
	Hypothesis testing-population proportion
	Veterans Day - November 11
13	Simple linear regression (SLR)-intro
	SLR-estimation
	SLR-Inference
14	SLR-model checking
	Thanksgiving Break/Indigenous People's Day/Columbus Day - November 25-27
15	SLR-transformations
	SLR -prediction
	Multiple regression
16	Multiple regression - continued
	Goodness of fit tests

Course Details - Instructor Contact Details

Email address: morrison.1043@osu.edu

Email: Please begin subject with "STAT 3470"; use my OSU email morrison.1043@osu.edu and avoid using the Carmen email tool. In order to protect your privacy, all course email correspondence must be conducted using your valid OSU name.# email account: any email from a non-OSU account will not be answered. I will attempt to answer emails within 48 hours, however, due to the large volume of emails this may not always be possible.

Course Details - Office Hours

Zoom Office Hours: Tue 10am -11am, or by appointment

Office Hours are conducted in one large Zoom room, but you can email me if you need to speak with me privately.

Course Details - Class Meeting Details

Class Meeting Details: TBA - Online -

Course Details - Course Description

Introduction to probability, Bayes theorem; discrete and continuous random variables, expected value, probability distributions; point and interval estimation; hypotheses tests for means and proportions; least squares regression. Offered online. Prereq: Math 1152, 1161.xx, 1172, 1181H, or equiv, or permission of instructor. Not open to students with credit for 3440, 3450, 3450.01, 3450.02, 3460, 3470, or 3470.01.

Prerequisite(s) / Corequisites: Prereq: Math 1152, 1161.xx, 1172, 1181H, or equiv, or permission of instructor. Not open to students with credit for 3440, 3450, 3450.01, 3450.02, 3460, 3470, or 3470.01.

Course Details - More About This Course

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.

Course Details - Course Learning Outcomes

Primary Course Goal:

This course satisfies the General Education foundation requirement in Mathematical and Quantitative Reasoning or Data Analysis which has the following goals and expected learning outcomes:

Goals: Successful students will be able to apply quantitative or logical reasoning and/or mathematical/ statistical methods to understand and solve problems and will be able to communicate their results.

Course Objectives:

- To enable you to use statistical tools for presentation and descriptions of data.
- To enable you to correctly apply probability rules and counting techniques.
- To enable you to understand the use of sampling distributions as the foundation of inference.
- To enable you to analyze data through linear regression, confidence intervals, and hypothesis tests.

Expected learning outcomes (ELOs)

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

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

Course Details - Course Supplies

Carmen

This class will use Carmen. In Carmen, you will find copies of the syllabus, homework assignments, lecture notes and other important documents. Carmen will also be used to keep track of your assignment grades. Additionally, materials for lectures will be uploaded to the Carmen.

Online Materials

- Lectures, materials, assignments, announcements, and other information will be posted to the course Carmen site.
- Students are asked to use the Carmen discussion boards to ask

questions or discuss topics relevant to this course. These will not be graded.

- There will be a discussion board dedicated to each homework assignment. Students are encouraged to answer each other's questions and 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 Carmen course site regularly, and are encouraged to customize Carman 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.

Optional Materials

- Texas Instruments 83 Plus (or higher) Graphing Calculator.
- University provided iPad.

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

Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365. Visit the installing Office 365 (go.osu.edu/office365help) help article for full instructions.

Technology Skills Needed for This Course

- Basic computer and web-browsing skills.
- If you need technical assistance, either call 614-688-HELP, or refer to the online instructions: <https://resourcecenter.odee.osu.edu/carmenzoom>
- 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 Carmen quizzes.

Required Equipment

- Computer: current Mac (MacOS) or PC (Windows 10) with high-speed internet connection
- Webcam: built-in or external webcam, fully installed (if virtual office hours)
- Microphone: built-in laptop or tablet mic or external microphone(if virtual office hours)
- Other: a mobile device (smartphone or tablet) to use for BuckeyePass authentication

If you do not have access to the technology, review options for technology and internet access at go.osu.edu/student-tech-access.

Course Details - Detailed Course Schedule

The following tentative course schedule is subject to change.

#	Date	Week	Topic to be covered	Assessments
1	August 25-28	1	Sample spaces and events	
2			Axioms and properties of probability	
3	August 31- Sept 4	2	Counting techniques Conditional probability-	Quiz 1
4			Law of total probability, Independence	
5			Discrete Random Variable (RV)	
6	September 7-11	3	Probability distribution-discrete	Homework 1
7			Expectation and variance-discrete RV	
8			Labor day - September 7	
9	September 14-18	4	Binomial distribution	Homework 2
10			Poisson and Negative binomial distributions	
11			Continuous random variables- density and distribution functions	
12	September 21-25	5	Percentiles and expected values- continuous RV	Quiz 2
13			Normal distribution	
14			Exponential, Gamma distributions	
15	September 28-2	6	Joint probability distributions	Quiz 3
16			Conditional distributions	
17			conditional expectation	
18	October 5-9	7	Covariance and correlation	
19			Sampling distribution of a statistic	
			Exam 1 - October 8 - 5:20-6:15pm in EA 0160	
20	October 12-16	8	distribution of the sample means and central limit theorem.	

21			concepts of estimation and inference	Homework 3
22			Autumn Break - October 15-16	
23	October 19-23		Point Estimation	Quiz 4
24		9	Method of moments-point estimation	
25			Maximum likelihood-point estimation	
26	October 26-30		Confidence Intervals	Quiz 5
27		10	Large sample intervals for means.	Homework 4
28			Large sample intervals for proportions.	
29	November 2-6		Confidence intervals for means of normal populations.	
30		11	Hypothesis testing procedure.	Homework 5
31			Hypothesis testing procedure-population mean	
			Exam 2 - November 5 - 5:20-6:15pm in EA 0160	
32	November 9-13		p-value approach	Quiz 6
33		12	Hypothesis testing-population proportion	
34			Veterans Day - November 11	
35	November 16-20		Simple linear regression (SLR)-intro	Homework 6
36		13	SLR-estimation	Quiz 7
37			SLR-Inference	
38	November 23-27		SLR-model checking	
39		14	Thanksgiving Break/Indigenous People's Day/Columbus Day - November 25-27	

40	November 30- December 4	15	SLR-transformations	Homework 7
41			SLR -prediction	Quiz 8
42			Multiple regression	
43	December 7-9	16	Multiple regression - continued	Homework 8
44			Goodness of fit tests	
	TBD		Final Exam - location, date and time TBD by Registrar	

Course Details - Grading Policy

Assignment or category	Percentage
Homework Assignments	25%
Quizzes	10%
Mid-term: Exam 1	20%
Mid-term: Exam 2	25%
Final Exam	20%
Total	100

Course Details - Grading Scale

Letter Grade	Percentage Range
A	100% to 93%
A-	< 93% to 90%
B+	< 90% to 87%
B	< 87% to 83%
B-	< 83% to 80%
C+	< 80% to 77%
C	< 77% to 73%
C-	< 73% to 70%
D+	< 70% to 67%
D	< 67% to 60%

Letter Grade	Percentage Range
E	< 60% to 0%

Course Details - Other

Assignments Information

Homework Assignments:

There are 7 homework assignments that you will complete during the semester.

Students must submit solutions to these assignments online, through the WebAssign interface. If you answer a question part correctly on the number specified attempts (Ex: on the first 3 attempts), you get full credit. You can keep answering after that (up to 100 attempts) but you will receive no credit for answers beyond the specified attempts (Ex: 3 attempts). However, this may be useful if later parts of the problem depend on that part.

Students are encouraged to seek help from teaching assistant and instructor's office hours for these problems. Students are allowed to use any type of material to help with understanding concepts but are not allowed to search for solutions to the specific problems on the assignment.

Please read the instructions on Webassign for each homework set carefully, as there are sometimes problems you are told to skip or given hints for.

Links to homework assignments can be found within the weekly modules or by going to the **Assignments link** on the left side of the CarmenCanvas course page. You may use any materials you want to complete the homework. We encourage you to work on your own to get the most learning possible.

Any question about homework should be directed to the Carmen discussion board for this class. But, if your question requires significant back-and-forth communication, I may ask you to make an appointment or attend office hours, especially if your question isn't easily answerable over discussion board. Therefore, please do not wait until the last moment to begin working on

assignment, so that we can help in a timely manner.

Quiz Assignments:

There are 8 Quiz assignments that you will complete during the semester. You will be given two attempts and must submit solution to these quizzes through Carmen. You can find the tentative due dates for these quiz assignments in our tentative schedule (at the end of this document).

Each Quiz assignment is worth 10 points. Links to Quiz assignments can be found on Carmen Site or by going to the **Quizzes link** on the left side of the Carmen course page. You may use any materials you want to complete the Quizzes.

In general, late submissions are not accepted for quizzes. However, in case of emergency with proper documentation, you may contact the instructor to discuss makeup work.

Important:

- **For both homework and quizzes**, please be very careful about your rounding.
- Always round to the exact number of decimal places asked for.
- If there are intermediate steps in a problem, please hold several decimal places beyond those required for the final answer if you need to round intermediate steps.
- Please use SALT or other technology for more precision rather than statistical tables.
- Failure to do these things may cause you to lose points even if your method was correct. If you followed these steps and still got an answer wrong due to rounding discrepancies, feel free to contact your instructor or TA.

Exam Information and Policies

There will be **two midterm exams** and **one final exam**. Exams are in person on paper. No extra materials are to be used on the exams. Exam questions contain multiple choice questions and contain short answer questions. The exams are closed book. Calculators will be allowed on the exam as long as they cannot connect to the internet. Please note that solutions, not answers, will be graded; a correct answer alone will not get full credit if the steps leading to it are not clear and/or correct.

An online practice exam will be posted for each exam. You **MUST HAVE** your Buck-ID available to show the proctor during the exam.

If you have a documented class conflict, there will be a make-up exam scheduled. If you have an emergency or extended illness and are going to miss an exam, please notify Dr. Morrison as soon as possible so arrangements can be made. Please also have documentation (doctor's note, etc.) that says you were too sick to take the exam (not just that you visited the doctor). Your documentation must be approved prior to your being allowed to take a make-up exam.

Any missed exams with no communication to us within 24 hours (except for extreme emergencies) may receive a 0. If you missed the exam for an unexcused reason, you might not be allowed to make it up and may receive a zero. However, for some excused reasons, there may be an opportunity to make-up exams with a penalty of up to 25% of the total points you received from the exam.

Late Assignments

It is important for you to keep up with the work in this course, both for your own stress levels, and so that we can all be on the same page when we're discussing

material.

Late assignments Homework will be accepted for 24 hours after the original due date with a 5% deduction per day. After this, no late assignments will be accepted. Do not wait until the last moment to begin working on assignments. Generally, late Quiz assignments are not accepted. Please plan your time so that you can complete assignments far enough in advance to avoid any last-minute problems.

If exceptional circumstances (sudden onset of illness, unexpected family situations, etc.) arise, contact the instructor (Dr. Morrison) to discuss the possibility of an extension.

Grade Disputes

It is extremely important that you **pay attention to your grades on a regular basis**. If you feel that an assignment has been graded incorrectly or unfairly, you must speak with Dr. Morrison, within one week of getting your grade on that assignment. **We will not re-grade assignments at the end of the semester or offer any extra credit if you are not satisfied at that time with your final course grade, especially since you will have known all semester what is expected of you to earn your desired grade in this course.**

We believe strongly that grades are earned, not given. If you need to achieve a certain grade in this course, be careful to complete all assignments, plan appropriate time for studying, come to office hours/tutor room and ask questions, review feedback you receive on activities so you can talk to us about any problems you missed, and get help as needed in order to achieve your goal. **We hope your grade in the course will be just as important to you on Day 1 as it is at the end of the semester, especially since you will have known the expectations of this course all semester and are in control of deciding what grade to earn.** We do not bump grades at the end of the semester, we do not have extra credit and we cannot change grades based on a person's

circumstances. Do not expect your exams to be curved; they may or may not depending on how the class does. We do not curve the final total points at the end.

IMPORTANT! Keep track of your grades!!

Course Details - Instructor Policies

Instructor feedback and response time

Grading and feedback

Exam, Homework, and quizzes grading questions should be directed to Dr. Morrison.

If you find a discrepancy in the grades of homework, quiz, and midterm exam, then you must bring it to Dr. Morrison's attention no later than one week from the day the scores are in Carmen. After that grades will typically not be changed.

E-mail

Email messages sent to your lecture instructor or teaching assistant should be responded to within 48 hours on weekdays.

Specific technical questions about the course material that require significant back-and-forth communication are not well suited for e-mail; while we will do our best to answer such questions, we may ask that you attend office hours if your question isn't easily answerable over email.

In order to protect your privacy, all course email correspondence must be done through a valid OSU Lastname.number or Buckeyemail account (NOT through the course website (Carmen Canvas)). If you send an email message and get no reply within 48 hours, please send that message again.

Attendance, participation, and discussions

Student participation requirements

We expect you to be actively engaged in the learning process. You are responsible for your learning. Successful students perform a variety of positive academic behaviors like reviewing the Carmen page, downloading notes, being proactive in contacting a TA or classmate as necessary, etc. Schedule a minimum of 6 hours to prepare for this course. This equates to 9 hours weekly when the 3 hours for lecture. Please seek assistance in managing any non-academic responsibilities prior to any potential for under-performance. Please also take advantage of optional opportunities to meet with me and/or the TAs during office hours. We're here to help!

The following is a summary of everyone's expected participation:

- **Watching Online Lectures**

Students are expected to attend and participate in the in-person class meetings.

- **Completing all Assessments**

You must complete quizzes and upload homework assignments.

- **Office hours:**

You are encouraged to attend office hours for assistance. If you need to speak with the instructor privately about a topic that cannot be easily discussed during office hours, please contact Dr. Morrison to schedule a time to meet.

Discussion and communication guidelines

The following are my expectations for how we should communicate as a class.

- **Writing style:** While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. A more conversational tone 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. I will provide specific guidance for discussions on controversial or personal topics.
- **Citing your sources:** When we have academic discussions, please cite your sources to back up what you say. For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.

Above all, please remember to be respectful and thoughtful in your communications in class and electronically. Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably.

Course Details - AI Use Policy

GenAI can fabricate information (for example, creating citations to sources that do not exist) or omit key information. You are ultimately responsible for the accuracy and integrity of your submitted work. Unless explicitly permitted below, representing AI-generated content as your own work is a violation of the Code of Student Conduct. Please check with your instructor if you have questions.

These levels may apply to the entire course or specific assignments, as indicated by the instructor:

- Permitted: You may use GenAI as a virtual tutor to explain concepts, quiz you on course topics, or summarize content you have personally authored (e.g., your own class notes).
- Prohibited: The materials in this course may be subject to copyright protection. Do not input or allow AI to access external or instructor-created course materials (e.g., assigned readings, slides) without explicit instructor permission. Do not use GenAI to outline, draft, translate, or write any part of an assignment.

Syllabus - University Policies

Office of Undergraduate Education - Standard Syllabus Statements

- [Academic Misconduct](#)
- [Religious Accommodations](#)
- [Accommodations for Disability and Illness](#)
- [Intellectual Diversity](#)
- [Grievances and Solving Problems](#)
- [Creating an Environment Free from Harassment, Discrimination, and Sexual Misconduct](#)
- [Copyrights](#)
- [Content Warnings](#)
- [Mental Health Support](#)
- [Resources for Military-Connected Students](#)
- [Campus-wide Class Cancellations](#)