



THE OHIO STATE UNIVERSITY

STAT 3470.01

Introduction to Probability and Statistics for Engineers (25816)

Autumn 2026

Syllabus - Instructor Information

Andrew Kerr

Professional Qualifications

Master's, Applied Statistics, The Ohio State University

Bachelor's, Mathematics, The Ohio State University

Syllabus - Required or Recommended Readings

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

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	MONDAY	WEDNESDAY	FRIDAY
1	8/24 No Class	8/26 Sample Spaces and Events	8/28 Axioms and Properties of Probability
2	8/31 Counting Techniques Conditional Probability	9/2 Law of Total Probability Independence Homework 1 Due	9/4 Discrete Random Variables (DRV)
3	9/7 No Class - Labor Day	9/9 Probability Distributions (DRV) Homework 2 Due	9/11 Expectation and Variance (DRV)
4	9/14 Binomial Distribution	9/16 Poisson Distribution Negative Binomial Distribution Homework 3 Due	9/18 Continuous Random Variables (CRV)

5	9/21 Percentiles Expected Value and Variance (CRV)	9/23 Normal Distributions Homework 4 Due	9/25 Exponential and Gamma Distributions
6	9/28 Joint Probability Distributions	9/30 Conditional Probability Distributions Homework 5 Due	10/2 Conditional Expectation
7** Midterm 1 will be administered on Tuesday, October 6.	10/5 Covariance and Correlation	10/7 Sampling Distribution of a Statistic Homework 6 Due	10/9 Distribution of the Sample Mean
8	10/12 Central Limit Theorem	10/14 Concepts of Estimation and Inference Homework 7 Due	10/16 No Class
9	10/19 Point Estimation	10/21 Method of Moments Estimation Homework 8 Due	10/23 Maximum Likelihood Estimation

10	10/26 Intro to Confidence Intervals	10/28 Large Sample Intervals for a Population Mean Homework 9 Due	10/30 Large Sample Intervals for a Population Proportion
11	11/2 Confidence Intervals for Means of Normal Populations	11/4 Hypothesis Testing Procedures Homework 10 Due	11/6 Hypothesis Tests for a Population Mean
12** Midterm 2 will be administered on Tuesday, November 10.	11/9 The p-value Approach	11/11 No Class - Veteran's Day Homework 11 Due	11/13 Hypothesis Tests for a Population Proportion
13	11/16 Introduction to Simple Linear Regression (SLR)	11/18 Estimation in SLR	11/20 Inference in SLR
14	11/23 Model Checking in SLR	11/25 No Class - Thanksgiving Break	11/27 No Class - Thanksgiving Break
15	11/30 Transformations in SLR	12/2 Prediction in SLR Homework 12 Due	12/4 Multiple Regression

16	12/7	12/9	12/11
	More on Multiple Regression	Goodness-of-Fit Tests	No Class
		Homework 13 Due	

Course Details - Instructor Contact Details

Office Location: Cockins Hall 212B (CH 212B)

Email: kerr.109@osu.edu

Course Details - Office Hours

Office Hours Monday and Wednesday, 11:30am - 12:25pm in Cockins Hall, 212B.

Course Details - Additional Instructional Staff

Teaching Assistant:

Zehao Wang

Email: wang.17016@osu.edu

In-Person Office Hours: Friday, 11:30AM – 12:25PM in PO0151 (Pomerene Hall room 0151)

Online Office Hours: 5:20PM - 6:15PM, Thursday

- link: <https://osu.zoom.us/j/95655626403?pwd=4BwnlHB44MHJtQsUrQWn7qjPpinN3S.1>
- meeting id: 956 5562 6403
- passwd: 561340
- log in with Ohio State username and password

Course Details - Class Meeting Details

Class Meeting Details: 01:50 PM-02:45 PM - Sullivant Hall 220 - MWF

You should plan to attend each lecture, as slides will not be posted on Canvas. If you need to miss a lecture, please get notes from another student in class. If you have questions over missed material, I am happy to answer questions but cannot lecture the material again. You should also complete the homework assignments as appropriate.

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. 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 3470.02.

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 3470.02.

Course Details - Course Learning Outcomes

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

1. Use logical, mathematical and/or statistical concepts and methods to represent real-world situations.
2. Use diverse logical, mathematical and/or statistical approaches, technologies and tools to communicate about data symbolically, visually, numerically and verbally.
3. Draw appropriate inferences from data based on quantitative analysis and/or logical reasoning.
4. Make and evaluate important assumptions in estimation, modeling,

- logical argumentation and/or data analysis.
5. Evaluate social and ethical implications in mathematical and quantitative reasoning.

General education goals and expected learning outcomes

As part of the Data Analysis category of the General Education curriculum, this course is designed to prepare students to be able to do the following:

1. 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.
2. Students develop skills in drawing conclusions and critically evaluating results based on data.
 1. Students understand basic concepts of statistics and probability.
 2. Students comprehend methods needed to analyze and critically evaluate statistical arguments.
 3. Students recognize the importance of statistical ideas.

Course Details - Detailed Course Schedule

In addition to the posted class schedule, you can read along with the topics in the course textbook:

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

Binomial, Poisson probability distributions	3.4, 3.6
Continuous random variables, density and distribution functions, percentiles and expected values, the Normal distribution	4.1-4.3
Exponential, Gamma distributions, joint probability distributions, conditional distributions, conditional expectation, covariance and correlation	4.4, 5.1-5.2
Sampling distribution of a statistic, distribution of the sample mean and central limit theorem	5.3-5.5
Populations parameters, samples statistics, concepts of estimation and inference	6.1
Point estimation, including method of moments and maximum likelihood	6.2
Confidence intervals, large sample intervals for means and proportions	7.1-7.2
Confidence intervals for means of normal populations, hypotheses and testing procedures	7.3, 8.1
Hypothesis testing, tests for population means and proportions	8.2-8.4
Simple linear regression	12.1-12.2
Simple linear regression, estimation and inference	12.3-12.4
Simple linear regression, model checking, transformations	13.1-13.2
Multiple regression, goodness of fit tests	13.4, 14.1

Course Details - Grading Policy

Assignment Category	Percentage
Homework Assignments on WebAssign	25%
Midterm 1	25%
Midterm 2	25%
Final Exam	25%
Total	100%

Homework Assignments

Homework will be administered via WebAssign, with assignments due every week. Each homework will cover one major topic area. Homework due dates will be on Wednesdays except when we need to work around a holiday or exam. It is the students' responsibility to check Carmen and WebAssign regularly and be aware of deadlines. The lowest three homework assignments will be dropped, so there are no late assignments. Homeworks will be automatically graded based on final solutions, but I highly recommend writing out full solutions to the problems as if you were submitting a written homework assignment to ensure a complete understanding of the material. Three attempts are allowed for each problem without penalty, with a 10% penalty for each additional attempt, to encourage carefully solving problems and asking for help, when necessary, rather than attempting to solve problems by brute force

You are encouraged to work with others in your class, but you need to submit your own work. Collaboration and studying with others can help in learning material but be sure to practice working on your own as well, as that will provide the best practice for exams.

Exams

There will be three (3) in-person exams for this course. You are permitted one

page (two-sided, 8.5"x11") of hand-written notes during the first two exams, and two such pages on the final exam. Two midterm exams will be given: the first is on Tuesday, October 6 (6:30 – 8:00 PM) and the second is on Tuesday, November 17 (6:30 – 8:00 PM). The final exam will occur during finals week (**To be updated**). Rooms will be announced early in the semester.

The coverage of the exams will be as follows: the first exam will cover probability; the second exam will focus on joint distributions, estimation, and confidence; the final exam will be comprehensive with an emphasis on hypothesis testing and regression.

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

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%
E	< 60% to 0%

Syllabus - University Policies

Office of Undergraduate Education - Standard Syllabus Statements

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