STAT 3470
Introduction to Probability and Statistics for Engineers
Autumn 2018, Section 15302, 3 Credit Hours

GENERAL COURSE INFORMATION	
Instructor	Eloise Kaizar, PhD [Message via Carmen Conversations](#) kaizar.1@osu.edu 221 Cockins Hall (CH) (614) 247-2585
Course Description	Introduction to probability, Bayes' theorem; discrete and continuous random variables, expected value, probability distributions; point and interval estimation; hypothesis tests for means and proportions; least squares regression
Prerequisites	Students should already know calculus (differentiation, integration), the exponential function, finite and infinite sums, basic set algebra. Prerequisite courses: Math 1152, 1161.xx, 1172, 1181H, 153, or 254.
Ohio State University General Education	This course satisfies the General Education (GE) requirement in Data Analysis. **GE Expected Learning Outcomes:** 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. Course interactions and assignments are designed to help students achieve these outcomes.

INTERACTION AND COMMUNICATION	
Interactive Learning Resources	**Lecture:** 1:50 – 2:45pm Mon, Wed, and Fri in University Hall 014 (UH014). Students should complete relevant reading assignments *prior to* attending lecture. **Website:** https://carmen.osu.edu, including discussion boards **Office Hours:** Wednesdays, 8:30-9:25am in CH221, and by appointment (email kaizar.1@osu.edu to propose times) **Free Tutoring:** Department of Statistics TAs are available in the MSLC. **Practice Problems:** Extra problems (not for assessment) will be provided in WebAssign (see Required Materials below).
Communication	**Announcements** made during lecture or on the Carmen website supersede information in this syllabus. It is each student's responsibility to stay up-to-date with announcements. - Questions about **your particular situation** (e.g., grade, exam time conflict) should be messaged to the instructor, who will typically respond within two business days. - Questions about **course activities, content, or ideas** should be posted to an appropriate Carmen discussion board (create a new one if needed!). Such questions emailed or messaged to the instructor will be posted to the discussion board, with appropriate anonymization. Students are encouraged to answer each other's questions. The instructor will typically respond to posts within two business days.

REQUIRED MATERIALS	
WebAssign and Textbook	The **WebAssign** electronic homework system includes access to the course textbook in ebook format. The Course Textbook is: **Probability and Statistics for Engineering and the Sciences (9th edition), by Jay Devore.** You will have free access to WebAssign via this link until September 4. By then, you must purchase WebAssign and the textbook (e.g., from the university bookstore). They are available in three formats. You only need to choose **ONE** of these formats. • *WebAssign only* (which includes the textbook in eBook format) • *WebAssign and Hard Copy Textbook* • *Cengage Unlimited*, which is a digital subscription provided by the course textbook publisher. The university bookstore lists a one-semester subscription for this course, but a 12-month subscription is also available. With Cengage Unlimited, you can access any Cengage materials you are using across all of your courses and a library of over 22,000 ebooks, study guides and reference materials. (The course textbook is one of these ebooks) You can **rent a print book** of the STAT 3470 textbook (for an extra fee) when you activate the WebAssign course for STAT 3470**.** You may also **purchase a looseleaf version** of the STAT 3470 textbook (for an extra fee), which you can keep. When your subscription ends, you can choose up to six ebooks to retain in your virtual locker for an additional 12 months. Log into WebAssign by following this link. If you have any trouble, consult the Quick Start Guide or contact Customer Support.
Portable Device	A **portable device** (e.g., tablet, cell phone, laptop, or clicker) is required to access the Top Hat classroom participation system. Follow these instructions to register for Top Hat. The Top Hat join code for this class is: 950255

ASSESSMENT	
Expectations	Students will be assessed on their learning of ideas and concepts and achievement of skills presented during lecture, on the course website, and in assigned readings. Students should expect that *some* ideas, concepts or skills presented in the textbook will *not* be repeated in lecture or on the course website.
Participation (3%)	Each participation activity is graded on completion. Activities include: • Prerequisite self-assessment. (completion required) • Welcome to WebAssign assignment. (completion required) • Top Hat activities. Most lectures will include one Top Hat activity. (completion of 80% of Top Hat activities is required, but attendance at all lectures is highly recommended)
Homework (12%)	Eleven homework assignments will be administered via WebAssign. For each assignment, earned percentages reported in WebAssign will be rounded up by 10% (to a maximum of 100%) for final grade calculation. Students may attempt each homework assignment up to 3 times. Students may work together to solve homework problems.
Quizzes (5%)	Eleven quizzes will be administered via Carmen. Students may *not* work together to solve quiz problems.
Midterm Exam 1 (25%)	Wednesday, October 3, 5:20-6:15pm See the course website for details and rooms as they are announced.
Midterm Exam 2 (25%)	Wednesday, November 14, 5:20-6:15pm See the course website for details and rooms as they are announced.
Final Exam (30%)	Friday, December 7, 8:00-9:45pm See the course website for details and rooms as they are announced.
Make-up Exam Policy	Students who have a conflict with the primary exam time (due to a class or some other event) must message the instructor **at least two weeks before** the scheduled exam. Late requests for make-up exams may be denied.
Missed Work Policy	Late homework and quiz submissions are not accepted, and no make-up exams will be scheduled late. Students experiencing an emergency or other unexpected work interruption should contact the instructor as soon as possible to provide documentation and request an exception.
Grading Scheme	This course uses The Ohio State University standard scheme based on percentages: <table><tr><td>A</td><td>A-</td><td>B+</td><td>B</td><td>B-</td><td>C+</td><td>C</td><td>C-</td><td>D+</td><td>D</td><td>E</td></tr><tr><td>≥93%</td><td>≥90%</td><td>≥97%</td><td>≥83%</td><td>≥80%</td><td>≥77%</td><td>≥73%</td><td>≥70%</td><td>≥67%</td><td>≥60%</td><td>≥0%</td></tr></table>
Academic Misconduct	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/**.

ACCOMMODATIONS AND WELLBEING	
Disability Services	The University strives to make all learning experiences as accessible as possible. 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**.**
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.

TENTATIVE LECTURE SCHEDULE AND ASSIGNED READINGS

#	Date	Topic	Textbook Sections
1	Wed. 8/22	Sample Spaces and Events; Probability	1.1, 2.1, 2.2 Intro and "Interpreting Probability"
2	Fri. 8/24	Axioms and Properties of Probability and Counting	2.2, 2.3
3	Mon. 8/27	Conditional Probability	2.4
4	Wed. 8/29	Independence and Random Variables	2.5, 3.1
5	Fri. 8/31	Probability Distributions for Discrete RVs	3.2
	Mon. 9/3	**Labor Day; No Class**	
6	Wed. 9/5	Expected Values (and Variance)	3.3
7	Fri. 9/7	Binomial Probability Distributions	3.4
8	Mon. 9/10	Poisson Probability Distributions	3.6
9	Wed. 9/12	Probability Density and Cumulative Distribution Functions	4.1, 4.2
10	Fri. 9/14	Expected Values revisited	4.2
11	Mon. 9/17	The Normal Distribution	4.3
12	Wed. 9/19	The Exponential and Gamma Distributions	4.4
13	Fri. 9/21	Jointly Distributed Random Variables	5.1 and 1.2 "Notation"
14	Mon. 9/24	Expected Values, Covariance and Correlation	5.2
15	Wed. 9/26	Statistics and Their Distributions	5.3
16	Fri. 9/28	Statistics and Their Distributions	5.3
17	Mon. 10/1	The Distribution of the Sample Mean	5.4
18	Wed. 10/3	The Distribution of a Linear Combination	5.5
	Wed. 10/3	**Midterm Exam 1**	
19	Fri. 10/5	General Concepts of Point Estimation	6.1
20	Mon. 10/8	General Concepts of Point Estimation	6.1
21	Wed. 10/10	Methods of Point Estimation	6.2
	Fri. 10/12	**Autumn Break; No Class**	
22	Mon. 10/15	Basic Properties of Confidence Intervals	7.1
23	Wed. 10/17	Basic Properties of Confidence Intervals	7.1
24	Fri. 10/19	Confidence Intervals for a Population Mean or Proportion	7.2
25	Mon. 10/22	Intervals Based on a Normal Population Distribution	7.3
26	Wed. 10/24	Hypothesis and Test Procedures	8.1
27	Fri. 10/26	Hypothesis and Test Procedures	8.1
28	Mon. 10/29	z Tests for Hypotheses about a Population Mean	8.2
29	Wed. 10/31	The One Sample t Test	8.3
30	Fri. 11/2	The One Sample t Test	8.3
31	Mon. 11/5	Tests about a Population Proportion	8.4
32	Wed. 11/7	Confidence Intervals Revisited	7.2 (again)
33	Fri. 11/9	Goodness of Fit Tests	14.1
	Mon. 11/12	**Veteran's Day; No Class**	
34	Wed. 11/14	The Simple Linear Regression Model	12.1
	Wed. 11/14	**Midterm Exam 2**	
35	Fri. 11/16	Estimating Model Parameters	12.2
36	Mon. 11/19	Inferences about the Slope	12.3
	Wed. 11/21	**Thanksgiving; No Class**	
	Fri. 11/23	**Thanksgiving; No Class**	
37	Mon. 11/26	Inferences about the Mean and Prediction	12.4
38	Wed. 11/28	Assessing Model Adequacy	13.1
39	Fri. 11/30	Regression with Transformed Variables	13.2
40	Mon. 12/3	Multiple Regression	13.4
41	Wed. 12/5	Multiple Regression	13.4