



STA 3032 (Class Number: 27849)

Engineering Statistics

Fall 2021

MWF 3:00-3:50 p.m. (Room: WEIM 1064)

The course is offered fully in person. You are expected to wear approved face coverings at all times during class and within buildings even if you are vaccinated.

The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.

Instructor: Juhyung Lee

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Course Description: A survey of the basic concepts in probability and statistics with engineering applications. Topics include probability, discrete and continuous random variables, confidence interval estimation, hypothesis testing, correlation, regression, and analysis of variance.

Prerequisite: MAC 2311.

Course Website: [e-Learning](#). Check course website regularly for any updates.

Course Material: Lecture notes posted on course website.

Required Text:

1. *Probability & Statistics for Engineers & Scientists* (9th ed.) by Walpole, Myers, Myers, and Ye.

Software: We will use the free statistical software [R](#).

Course Communication: Office hours and email.

- Always wear a mask if you plan to visit me or TAs in person.
- Put **3032** in the subject line of your email. I use course numbers to search emails from students.

Course Objectives:

1. Access, manipulate, and analyze data using statistical software.
2. Produce appropriate graphs and descriptive statistics for one and two variables, for both categorical and continuous data.
3. Interpret graphs and descriptive statistics for one and two variables.
4. Know and apply the basic probability rules, the concepts of expected value and variance for discrete and continuous variables.
5. Know and apply the central limit theorem, which is crucial for inference.
6. Understand confidence intervals and hypothesis tests.
7. Carry out and interpret one-sample and two-sample analyses for means and proportions.
8. Carry out and interpret statistical modeling using multiple regression and analysis of variance.
9. Know and apply basic quality control procedures.

Assignments and Grading:

- Grades will be based on the following components.

Homework	25%	
Exam 1	25%	in-class, September 29 (tentative)
Exam 2	25%	in-class, November 3 (tentative)
Exam 3	25%	in-class, December 8 (tentative)
Total	100%	

- Homework should be submitted to the relevant dropbox on course website in the form of **one single pdf file**.
- **No late homework will be accepted.** However, the lowest homework score will be dropped at the end of the semester.
- **Not all homework problems will be graded for each assignment.** TAs will grade the problems selected by me and announce the problems graded afterward.
- **All exams will be closed-book.** However, you may bring one letter-size (8.5 by 11 inches) cheat sheet (i.e., two pages) to each exam. You may bring your old cheat sheet(s) in addition to the current one.

- **Bring a scientific calculator (no cell phones!) to each exam.**
- **If you miss an exam, you must contact me by the end of the day.** Your case will be reviewed by me and if approved, (i) the other two exams will be reweighted if you missed Exam 1 or Exam 2; (ii) a take-home exam will be given if you missed Exam 3. This policy cannot be applied to more than one exam.
- I will strictly follow the cutoffs below for letter grades.

B+	87 to < 90	A	92 to 100	A-	90 to < 92
C+	77 to < 80	B	82 to < 87	B-	80 to < 82
D+	67 to < 70	C	72 to < 77	C-	70 to < 72
E	< 60	D	62 to < 67	D-	60 to < 62

Academic Integrity:

You may discuss homework with each other, but you must write up your solutions independently. You may never discuss exams with each other. You are held accountable to the [UF Student Honor and Conduct Code](#).

Students with Disabilities:

Students requesting accommodation for disabilities must first register with the [Disability Resource Center \(DRC\)](#). The DRC will provide documentation to the students who must then provide this documentation to the instructor when requesting information. You must submit this documentation prior to submitting any assignments for which you are requesting accommodation.

Course Evaluations:

Students are expected to provide feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

Tentative Course Outline

Module	Week	Content	Notes	Text
1	1-2	Descriptive Statistics Graphical Summaries of Data	1.1-1.3 1.4	1.1-1.5 1.6
2	2	Sample Space, Events, and Probability Permutations and Combinations Conditional Probability and Independence	2.1-2.2 2.3 2.4	2.1-2.2, 2.4-2.5 2.3 2.6, 2.7
	3-4	Random Variables and Probability Distributions	2.5.1-2.5.8	3.1-3.4, 4.1-4.4
	4	Discrete Random Variables Continuous Random Variables	2.5.9 2.5.10	5.1-5.2, 5.4-5.5 6.1-6.4, 6.7, 8.6-8.7
	5	Sampling Distributions and the Central Limit Theorem Quantile and Probability Plots	2.6 2.7	8.3-8.4 8.8
Exam 1				
3	6	Inference on Population Mean: Confidence Intervals Inference on Population Mean: Hypothesis Tests	3.1.1 3.1.2	9.1-9.5 10.1-10.4
	7	Inference on Population Proportion Inference on Population Variance Nonparametric Methods	3.2 3.3 3.4	9.10, 10.8 9.12, 10.10 16.1-16.2
4	8	Inference on Two Population Means: Confidence Intervals Inference on Two Population Means: Hypothesis Tests Inference on Two Population Variances	4.1.1 4.1.2 4.2	9.8, 9.11 10.5, 10.9 9.13, 10.10
	9	Nonparametric Methods Contingency Tables and Test of Independence	4.3 4.4	16.2-16.3 10.12
Exam 2				
5	10	Simple Linear Regression	5.1.1-5.1.6	11.1-11.6, 11.8
	11-12	Diagnostics and Data Transformations Multiple Regression	5.2 5.3.1-5.3.2	11.10 12.1-12.2, 12.4
	12-13	Multiple Regression Qualitative Predictors	5.3.3 5.4	12.5-12.6 12.8-12.9
6	14	Completely Randomized Design Multiple Comparisons Randomized Complete Block Design	6.1.1 6.1.2 6.2.1	13.1-13.3 13.6 13.7-13.8, 13.11
Exam 3				