STA3032 Engineering Statistics (3 Credit Hours)   Fall 2025

Instructor
Michael O'Connor
Email: oconnor.mw@ufl.edu
In-Person OH: FLO209
MWF 11:45am - 12:45pm

Head TA
Dhanashree Somani
Email: dhanashreesomani@ufl.edu
Online OH: Zoom
TR 3:30pm - 5pm

Additional Office Hours: This semester, STA3032 will be sharing office hours between sections. There is a document on Canvas directly below the syllabus named "Shared Office Hours." There you will find a schedule of the other office hours available to you each week.

Department Number: (352)392-1941

Prerequisites: Completion of MAC2311 or equivalent.

Materials and Supplies Fees: There are no materials or supplies fees for this course.

Required Textbook: *Probability & Statistics for Engineers & Scientists, 9th Edition* available via UF All Access. Author(s): Walpole, Myers, Myers, and Ye; ISBN-13:978-0134115856.

Software: You will need to download R studio, a statistical analysis programming software - here are some YouTube tutorials:

- *Mac*: https://www.youtube.com/watch?v=8NvvydRwxEI

- *Windows*: https://www.youtube.com/watch?v=mxNrU902uyc

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, and regression.

Course Goals:

- Access, manipulate, and analyze data using statistical software.

- Produce appropriate graphs and descriptive statistics for one and two variables, for both categorical and continuous data.

- Interpret graphs and descriptive statistics for one and two variables.

- Know and apply the basic probability rules, the concepts of expected value and variance for discrete and continuous variables.

- Know and apply the central limit theorem, which is crucial for inference.

- Understand confidence intervals and hypothesis tests.

- Carry out and interpret one-sample and two-sample analyses for means and proportions.

- Carry out and interpret statistical modeling using simple linear regression.

Student Learning Outcomes: At the end of this course, students will be expected to have achieved the following learning outcomes.

Content:

- Identify, describe, and explain the basic concepts, theories, and terminology of natural science and the scientific method, and apply them to analyze various systems.

- Demonstrate proficiency in accessing, manipulating, and analyzing data using statistical software, and producing appropriate graphs and descriptive statistics for one and two variables, across both categorical and continuous data.

- Interpret graphs and descriptive statistics for one and two variables, drawing meaningful insights from the data.

- Understand and apply the basic probability rules, as well as concepts of expected value and variance for both discrete and continuous variables.

- Apply the Central Limit Theorem effectively for inference, providing a foundation for statistical reasoning.

- Formulate mathematical models and arguments, utilizing statistical models to address real-world situations and provide effective solutions.

- Assessments will be made with textbook-based assignments, coding assignments, quizzes, and exams.

Critical Thinking

- Formulate empirically-testable hypotheses derived from the study of physical processes or living things, demonstrating a capacity for scientific inquiry and logical reasoning.

- Apply logical reasoning skills effectively through scientific criticism and argument, enabling rigorous evaluation of scientific ideas and theories.

- Apply techniques of discovery and critical thinking effectively to solve scientific problems and evaluate outcomes, demonstrating analytical skills in problem-solving.

- Assessments will be made with textbook-based assignments, quizzes, and exams.

Communication

- Communicate scientific knowledge, thoughts, and reasoning clearly and effectively, both in written and verbal form.

- Report on statistical analysis of people's attitudes towards choices and based on the framing of the choices, presenting findings with clarity and precision.

- Report on statistical analyses of global warming, employing numeric and graphical presentation to effectively convey information.

- Assessments will be made with textbook-based assignments.

GenEd: This course has been designated a General Education course in Mathematics (M) – see General Education Subject Area Objectives. Note that the minimum passing grade for General Education credits is a C.

Grading:

Task	Weight	Description
Homeworks	25%	Each homework will contain problems from the textbook and other problems deemed relevant in preparing for exam readiness. If a homework is posted, it will be announced on Canvas along with its due date - **late homeworks will receive a 0**. Canvas auto-submits homework at 11:59:00pm EST the day it is due.
Exam 1	25%	An in-person, free-response exam which will cover material from Chapters 1-3, 5, 6, and 8
Exam 2	25%	An in-person, free-response exam which will cover material from Chapters 9, 10, and 16
Exam 3	25%	An in-person, free-response exam which will cover material from Chapters 11 - 13

Final grades will be assigned based on the following tentative grading scale:

	$-$		$+$
A	(87,90)	(90,100)	NA
B	(77,80)	(80,84)	(84,87)
C	(67,70)	(70,74)	(74,77)
D	(57,60)	(60,64)	(64,67)
E	NA	(0,57)	NA

Incompletes will only be considered if the student has completed a significant portion of the course with a passing grade (D$-$ or better), and provides documentation for extenuating circumstances, such as hospitalization, accidents, or emergency family matters, that inhibits them from being able to complete the rest of the course. UF's grading policy details can be found at https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/.

Accessibility and Accommodations: Students with disabilities who experience learning barriers and would like to request academic accommodations should contact the Disability Resource Center. See the "Get Started With the DRC" webpage on the Disability Resource Center site. It is important for students to share their accommodation letter with their instructor and discuss their access needs as early as possible in the semester.

Evaluation Statement: Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online. Students can complete evaluations in three ways:

- The email they receive from GatorEvals
- Their Canvas course menu under GatorEvals
- The central portal at https://my-ufl.bluera.com

Guidance on how to provide constructive feedback is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Academic Policies and Resources: https://go.ufl.edu/syllabuspolicies

Module	Week(s)	Content	Textbook Sections
1	1–2	Summary Statistics: Location and Spread	1.1–1.5
		Graphical Summaries	1.6
2	2	Sample Space, Events, and Probability	2.1–2.2, 2.4–2.5
		Counting Methods: Permutations and Combinations	2.3
		Conditional Probabilities and Independence	2.6–2.7
		HW1	
	3–4	Random Variables	3.1–3.4, 4.1–4.4
		Discrete Probability Distributions	5.1–5.2, 5.4–5.5
		Continuous Probability Distributions	6.1–6.4, 6.7, 8.6–8.7
		HW2	
	5	Central Limit Theorem	8.3–8.4
		Quantile and Probability Plots	8.8
		Exam 1	
3	6	Inference on Population Mean: Confidence Intervals	9.1–9.5
		Inference on Population Mean: Hypothesis Tests	10.1–10.4
		HW3	
	7	Inference on Population Proportion	9.10, 10.8
		Inference on Population Variance	9.12, 10.10
		Signed-Rank Test	16.1–16.2
4	8	Inference on Two Population Means: Confidence Intervals	9.8, 9.11
		Inference on Two Population Means: Hypothesis Tests	10.5, 10.9
		Inference on Two Population Variances	9.13, 10.10
		HW4	
	9	Contingency Tables: Test for Independence	10.12
		Wilcoxon Rank-Sum Test	16.3
		Exam 2	
5	10	Simple Linear Regression	11.1–11.6, 11.8
		HW5	
	11	Checking Regression Assumptions and Transforming Data	11.10
	11–12	Multiple Regression	12.1–12.2, 12.4–12.6
		Qualitative Predictors	12.8–12.9
		HW6	
6	13–14	One-Way ANOVA: Completely Randomized Design	13.1–13.3
		Multiple Comparisons	13.6
		Randomized Complete Block Designs	13.7–13.8, 13.11
		HW7	
		Exam 3	