STA 3032: Engineering Statistics

Fall 2025

Instructor

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Office Hours: 12:55pm-1:55pm MWF
Office: FLO 101A

Class information
Classroom: CSE A101
Class Hours: 1:55 pm - 2:45 pm MWF

Teaching Assistants

Sunghyun Cho
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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, and regression.

Course goals

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 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 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

Prerequisite(s)

MAC 2311 (Calculus beyond MAC 2311, e.g., integration by parts, may be needed and discussed). Note that this is a statistics course and calculus is essential part of statistics

Credit Hours: 3

Grades

The grades will be determined according to the following scale:

Grade	Range
A	94-100
A-	90-93
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	70-76
D	50-69
E	0-49

In total, there will be 3 tests and 8 homework assignments. The class will be weighted as follows:

Item	Weight
Homework	25 %
Exam with Lowest Score	10 %
Other Exam	32.5 %
Other Exam	32.5 %

A minimum grade of C is required for general education credit.

Attendance and Make-Ups

Attendance is expected and will be essential for performing well in the class. There is however, no attendance grade.

See university attendance policies:

https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

Late homework will be graded with a 15% deduction per day late. More than 3 days late will receive a 0.

Textbook (Required)

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

UF Grading Policies

https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

Evaluations

Students are expected to provide professional and respectful 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/.

Accommodations

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. The instructor must be emailed the form at least 14 days before an exam for accommodations to be arranged.

U Matter, We Care

U Matter, We Care offers care related resources and programs focused on health, safety, and holistic well-being.

Recordings

This class is 100% in-person, there will be no recordings of the lectures.

Weekly Schedule

Here is a tentative weekly schedule for the class. Homeworks will be due on Sunday at 11:59pm the week they are listed due:

Week 1

- (No class Mon/Wed)
- Introduction

Week 2

- Probability, Sample Space and Events (2.1-2.5)
- Conditional Probability and Independence (2.6)
- Bayes' Rule (2.7)
- Homework 1 Due

Week 3

- (No class Mon)
- Random Variables and Probability Distributions (3.1-3.4, 4.1-4.4)

Week 4

- Discrete Distributions (5.1-5.5)

Week 5

- Continuous Distributions (6.1-6.8)
- Homework 2 Due

Week 6

- Estimation (9.1-9.3)
- Maximum Likelihood (9.14)
- Test Review
- **EXAM 1** on Friday, September 26th

Week 7

- Intro to Hypothesis Testing (10.1 - 10.3)
- One Sample Tests (10.4)

Week 8

- Two Sample Tests (10.5)
- Types of Error
  - Level
  - Power
- Sampling Distributions
- Central Limit Theorem (8.3-8.7)
- Homework 3 Due

Week 9

- (No class Fri)
- Contingency Tables
- Chi-Squared Tests
- Confidence Intervals (9.1-9.5)

Week 10

- Confidence Intervals Continued (9.6, 9.8-9.13)
- Test Review
- Homework 4 Due
- **EXAM 2** on Friday, October 24th

Week 11

- Simple Linear Regression (11.1-11.8)

Week 12

- Multiple Regression (12.1-12.6)
- Categorical Predictors (12.8-12.9)
- (no class Friday)
- Homework 5 Due

Week 13

- Correlation

Week 14

- Transformations
- Penalized Regression
- Homework 6 Due

Week 15

- Thanksgiving Break

Week 16

- (no class Friday)
- Test Review
- Homework 7 Due
- **EXAM 3** on Wednesday, December 3rd

If this document is updated, an announcement will be made in class, and the new version will be uploaded to the course website in canvas.