IE 3610: Industrial Applications of Probability and Statistics II — Spring 2026

Tue/Thur, 11:00 AM–12:15 PM
128 Freeman Hall

Instructor

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Course Description

This course introduces statistical methods for analyzing engineering and scientific data. Topics include descriptive statistics, sampling distributions, and point estimation of parameters. Methods for constructing statistical intervals and conducting hypothesis tests for single and two samples are also introduced and applied to real-world problems. The course further covers simple and multiple linear regression for modeling relationships between variables and making predictions.

Course Objectives

Throughout the course, students will learn to apply statistical reasoning, use statistical software for computation, and clearly communicate data-driven conclusions. By the end of the course, students will be able to:

- Use descriptive statistics to investigate, describe, and summarize immediate data;
- Apply inferential statistics to draw conclusions.

Prerequisites

IE 3600 (Industrial Applications of Probability and Statistics I) is the prerequisite for this class.

Required Textbook

Montgomery, D. C. and Runger, G. C. (2018). *Applied Statistics and Probability for Engineers* (7th ed.). John Wiley & Sons, Hoboken, NJ.

Grading

Students are expected to monitor their grades throughout the semester. If you have questions regarding your grade at any point, please inquire in a timely manner; **do not wait until the end of the semester.** All requests for regrading must be submitted in writing and must include a brief but specific explanation of the concern. **Regrading requests must be submitted via email within one week of the graded material being returned.** Please note that, upon request, the entire assignment will be regraded, which results in either an increase or a decrease in the original score.

The final grade will be determined according to the following distribution:

Component	Percentage
Homework	20%
Exam 1	20%
Exam 2	25%
Final Exam	30%
Attendance & Quizzes	5%

Grading scale will be: 90–100 (A), 80–89 (B), 70–79 (C), 60–69 (D), <60 (F).

Homework

Homework will be assigned throughout the course as outlined in the syllabus. Each assignment is due one week after it is given. The lowest homework grade will be dropped. Therefore, we do not have to negotiate about what is an excused or an unexcused absence. A penalty of 50% of the total score will be applied for each day an assignment is submitted late.

Exams

Two midterm exams and one final exam will be administered according to the syllabus. All exams are closed book and closed notes; however, statistical tables will be provided for each exam. For each midterm, students may bring one **single-sided** 8.5" × 11" sheet containing handwritten notes, formulas, or other relevant material. This notes sheet must be submitted with the exam sheet. The final exam is cumulative and comprehensive, covering all material from the course. For the final exam, students may bring one **double-sided** 8.5" × 11" sheet of handwritten notes, which must be turned in with the exam sheet.

Only a basic scientific calculator may be used during exams. The use of all other electronic devices, including graphing calculators, laptops, tablets, cell phones, and smartwatches, is strictly prohibited.

Attendance and Participation

Attendance at lectures is expected. However, each student is responsible for all information distributed and/or presented during lecture periods. Also, the students are authorized to leave if the instructor or his assistant is more than 15 minutes late for a lecture. However, every possible effort will be made to inform you for any classes that are canceled due to an unscheduled conflict or emergency. Class starts promptly at 11:00 AM with each student's name being called.

Quizzes

Several in-class pop quizzes will be assigned. The quizzes will take about 10–15 minutes, will be open book and notes, and are worth 10 points. The lowest quiz grade will be dropped. Therefore, we do not have to negotiate about what is an excused or an unexcused absence. The quizzes will include questions and are problem-solving in nature and will be based on the previous lectures and homework.

Course Policies

- This is a quantitative, problem-solving engineering course, and most students will require regular practice and repetition to master the material.
    1. Attend every class after completing the relevant textbook reading. You may bring your notes (or lecture notes) and a calculator to class.
    2. Begin working on course material immediately. Do not fall behind during the first few weeks, as it can be difficult to recover later in the term.
    3. Plan to devote approximately two hours of work outside of class for every hour in class. In practical terms, expect to spend about one hour per day, six days a week, studying or working on assignments for this course.
- Make-up exams will not be given unless prior approval is obtained or in cases of documented exceptional circumstances. Please contact the instructor as soon as possible if such a situation arises.
- You are expected to complete all assigned readings prior to the start of each class session.
- You are required to submit your own work. While discussion of assignments with classmates is permitted (unless otherwise specified), copying another student's work or providing your work to others is prohibited. Any referenced material must be properly cited; failure to do so will be treated as plagiarism. If you are unsure about citation practices or what constitutes plagiarism, please consult the instructor or the Academic Integrity section of the Undergraduate Announcement.
- The use of cell phones or computers in class is not permitted. Cell phones should not be used as calculators on exams. Only non-programmable, non-graphing calculators may be used during examinations.
- Please consult this document before directing policy questions to the instructor or TA. Repeated questions that are

already addressed here may result in deductions from your final grade.

Redistribution of Course Materials

You are **NOT** permitted to share with any individuals, websites, or repositories any documents obtained from Canvas or Gradescope for this class. This includes, but is not limited to, homework assignments and their solutions, as well as any lecture notes shared on Canvas. Posting such documents or files constitutes a violation of copyright law. Furthermore, although sharing your own answers to homework or any others may not constitute a copyright violation, it does represent a violation of academic integrity, as it facilitates academic dishonesty by others.

Email

When emailing the instructor, please include the following text in the subject line: "[IE3610]" and allow for two business days to receive a response. Note that the instructor does not check Canvas messages. If you would like reach out to him, please use email rather than Canvas.

Canvas

To access the Canvas content management system for this course:

1. Open your web browser and navigate to: http://clemson.instructure.com.
2. Use your Clemson University username and password to log in.
3. The Welcome page will list your current courses.
4. Select this course and enter the canvas classroom.

If you were registered with a non-Clemson email, go to the direct URL: https://clemson.instructure.com/login/canvas to log into Canvas and access your course.

AI Policy

The use of artificial intelligence (AI) tools **is not permitted for work in this course under any circumstances**, even with proper documentation and citation. This policy supports the goals of the course learning outcomes and is in place because the skills and knowledge we are building in this class are meant to come from your thinking and effort, not AI, in order to support your mastery of skills. Concerns regarding potential violations of this policy will be reviewed fairly through the appropriate university academic integrity process.

Academic Integrity

As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a "high seminary of learning." Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form.

Academic integrity, in accordance with Clemson's vision, is expected of all students without exception. Students suspected of academic dishonesty (including any incident of cheating such as use of web resources such as Chegg, fabrication of false data, or committing plagiarism of any kind) will be brought to the Academic Integrity Board. Please be advised that your work will be examined for plagiarism, potentially using software such as Turn-it-in. Penalties for academic dishonesty range from failure of the assignment and/or failure of the course to suspension from the University. Please also be advised that homework assignments, quizzes, and examinations of previous course offerings may not be viewed without the permission of the instructor.

See the Undergraduate Academic Integrity Policy website for additional information and the current catalogue for the policy. For graduate students, see the current Graduate School Handbook for all policies and procedures.

Accessibility

Clemson University values the diversity of our student body as a strength and a critical component of our dynamic community. Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of facilities, course design, technology used for curricular purposes, or other campus resources. Students who experience a barrier to full access to this class should let the instructor know and are encouraged to request accommodations through SAS (Student Accessibility Services) as soon as possible. To request accommodations through SAS, please see this link: https://www.clemson.edu/academics/studentaccess/register.html. You can also reach out to SAS with questions by calling 864-656-6848, visiting SAS at the ASC Suite 239, or stopping by the office as a drop-in appointment.

The Clemson University Title IX Statement Regarding Non-Discrimination

Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran's status, genetic information or protected activity in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Education Amendments of 1972. This Title IX policy is located on the Access and Equity website. Ms. Alesia Smith is the Clemson University Title IX Coordinator, and the Assistant Vice President of Equity Compliance. Her office is located at 223 Brackett Hall, 864-656-3181 and her email address is alesias@clemson.edu. Remember, email is not a fully secured method of communication and should not be used to discuss Title IX issues.

Clemson University aspires to create a diverse community that welcomes people of different races, cultures, ages, genders, sexual orientation, religions, socioeconomic levels, political perspectives, abilities, opinions, values and experiences.

Emergency Preparation

Emergency procedures have been posted in all buildings and on all elevators. Students should be reminded to review these procedures for their own safety. All students and employees should be familiar with guidelines from Clemson University Public Safety. Clemson University is committed to providing a safe campus environment for students, faculty, staff, and visitors. As members of the community, we encourage you to take the following actions to be better prepared in case of an emergency:

1. Familiarize yourself with all possible exits, safer locations, and other key information on the emergency evacuation maps in this building, and those that you visit regularly.
2. Make a plan for how you would Run, Hide, and Fight in case of an active threat in this building, and those that you visit regularly. For example:
    a. Run: What are all the possible exits in this building, and the routes to them?
    b. Hide: What are the potential hiding locations in this room and building that are out of sight of doors and windows, how do you lock the door(s), how would you barricade the door(s) and windows, where do you turn off the lights?
    c. Fight: What tools are available in this room and building, should you have to fight?
3. Ensure you are signed up for emergency alerts. Alerts are only sent when there is a potential threat to safety, a major disruption to campus services, and once-monthly tests.
4. Download the Rave Guardian app to your phone.
5. Learn what you can do to prepare yourself for the hazards that affect our locations.

Tentative Schedule

Lecture	Date	Lecture Topic	Reading	Assignment
1	1/8	Introduction and Overview		
2	1/13	Review of Basic Statistics and Probability (1)		
3	1/15	Review of Basic Statistics and Probability (2)		
4	1/20	Descriptive Statistics	6.1–6.3	
5	1/22		6.4–6.7	
6	1/27	Point Estimation, Sampling Distribution	7.1–7.3	
7	1/29		7.3–7.4	Homework 1
8	2/3	Statistical Intervals for a Single Sample	8.1–8.2	
9	2/5		8.3–8.7	Homework 2
10	2/10	Exam Review		
11	2/12	**Exam 1**		
12	2/17	Tests of Hypothesis for a Single Sample	9.1–9.2	Homework 3
13	2/19		9.3–9.6	
14	2/24		9.7–9.8, 9.10–9.11	Homework 4
15	2/26	Statistical Inference for Two Samples	10.1–10.2	
16	3/3		10.4–10.5	
17	3/5		10.6–10.7	Homework 5
18	3/10	Introduction to R, Exam Review		
19	3/12	**Exam 2**		
	3/17	**Spring Break (NO CLASS)**		
	3/19	**Spring Break (NO CLASS)**		
20	3/24	Nonparametric Tests	9.9, 10.3	Homework 6
21	3/26	Simple Linear Regression and Correlation	11.1–11.3	
22	3/31		11.4–11.6	
23	4/2		11.8–11.10	Homework 7
24	4/7	Multiple Linear Regression		
25	4/9		12.1–12.2	
26	4/14		12.3–12.6	Homework 8
27	4/16	Using R for Regression		
28	4/21	Using R for Regression		
29	4/23	Final Exam Review		
Final Exam (Date/Time: TBD)				