Engineering Statistics–I

IE-24210, Spring 2020

Engineering Building 6303, Mon/Wed 9:00–10:15 (Sec. 066)

Instructor

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Office: Engineering Building 207–10527
Office Hours: 10:30–11:30am (M/W); 16:30–17:30pm (M/W); or by appointment. (No afternoon office hours on the first Monday of each month).

Textbook

Probability and Statistical Inference by Hogg, Tanis, and Zimmerman. Pearson, 9th edition (2014).

Web Page

https://AppliedStat.GitHub.io/teaching

Software

R Language (http://www.r-project.org).
Maple (http://www.maplesoft.com).

Prerequisite

The expectation is that you have already been exposed to the basic probability and statistics.

Policy

- Attendance Policy: Class attendance is mandatory. If you miss a class for some reason, it is your responsibility to get notes, etc. from someone in class. I will not repeat lectures during my office hours.
- Tardy Professor Policy: If the instructor has not arrived within 15 minutes of the scheduled class time, you may assume that class has been canceled.
- All drop/add procedures are your responsibility.

Description and Learning Objectives

– Engineering Statistics–I course will focus on basic concepts and theories of probability and their applications.

– Topics covered in this class include basic distribution theories and various probability distributions such as binomial, negative binomial, Poisson, exponential, normal, bivariate, etc.

– We will also study various limit and approximation techniques widely used for probability and statistics.

– The popular R statistical language will be handled in this class.

Upon successful completion of this course, a student will be able to:

- Understand basic concepts on probability theories.
- Obtain basics on discrete and continuous distributions.
- Obtain conditional distributions.
- Obtain bivariate distributions.
- Obtain various approximation technique.

Grading

For the regular face-to-face class, the final grade will be curved and calculated as follows. For the online class, we did not decide the rule yet.

Homeworks:	5%
Attendance:	5% (will be checked at random and count 3 points)
Midterms 1, 2:	60% (30+30)
Final:	30%

– ~~The lowest one of your mid-term exam grades can be replaced by the final exam if the final grade is better.~~ ~~For the in-class exam, the lowest one of your mid-term exam grades can be replaced by the final exam if the final grade is better.~~ Because of serious COVID-19 pandemic, the above policy can be changed without further notice.

Rough Grading Guide:

- A+: 95 $\sim$ 100 A: 90 $\sim$ 95-
- B+: 85 $\sim$ 90- B: 80 $\sim$ 85-
- C+: 70 $\sim$ 80- C: 60 $\sim$ 70-
- D+: 50 $\sim$ 60- D: 40 $\sim$ 50-
- F : below 40.

Exams

Midterm 1:	T.B.A.	In class
Midterm 2:	T.B.A.	In class
Final:	T.B.A.	

– All the in-class exams will be closed-book. (Other instructions will be provided for the online exam.)
– For the final exam, you are allowed to bring in *one* A4-size formula sheet made up by yourself. But, the formula sheet should be submitted after the exam.
– The final exam will be comprehensive.
– During the exams, a basic calculator will be permitted but cannot be shared with others.
– Calculators in smart phones, tablet PC and laptops are prohibited.
– No early or late exams will be allowed without a written and legitimate excuse.

Homeworks

– The students can collaborate on their homework problems, but they should submit their homeworks separately.
– Late homeworks will **not** be accepted.
– Up to 1 $\sim$ 3 problems, selected at random, will be graded in detail, on a scale of 0–5 each.
– To get full credit, you must show all work on the homework problems, which must be handed in in the same order as they are assigned.

Tentative Schedules

1 Basic probability theories.
2 Various discrete distributions such as binomial, negative binomial, Poisson, etc.
3 Various continuous distributions such as exponential, normal, etc.
4 Basics on discrete bivariate distributions.
5 Correlation coefficient.
6 Conditional distributions.
7 Basics on continuous bivariate distributions.
8 Bivariate normal distribution.
9 Functions of one random variable.
10 Functions of two random variables.
11 Moment-generating function technique.
12 Central limit theorem.
13 Approximations for discrete distributions.
14 Various inequalities useful for statistics.
15 Limit of moment-generating functions.
16 Final Exam.