
Engineering Statistics–I

IE-24210, SPRING 2020

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

Instructor	Chanseok Park (e-mail: CP<AT>PUSAN<DOT>AC<DOT>KR) 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	<i>Probability and Statistical Inference</i> by Hogg, Tanis, and Zimmerman. Pearson, 9th edition (2014).
Web Page	https://AppliedStat.GitHub.io/teaching
Software	<i>R Language</i> (http://www.r-project.org). <i>Maple</i> (http://www.maplesoft.com).
Prerequisite	The expectation is that you have already been exposed to the basic probability and statistics.
Policy	<ul style="list-style-type: none">• Attendance Policy: Class attendance is mandatory. If you miss a class for some reason, it is your responsibility to get notes, <u>etc.</u> 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 ~ 100 A: 90 ~ 95-
- B+: 85 ~ 90- B: 80 ~ 85-
- C+: 70 ~ 80- C: 60 ~ 70-
- D+: 50 ~ 60- D: 40 ~ 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 ~ 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.