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# Engineering Statistics–I

IE-2400210, SPRING 2025

Mon/Wed 9:00–10:15 (Sec. 066)

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<b>Instructor</b>	Chanseok Park (e-mail: CP<AT>PUSAN<DOT>AC<DOT>KR) OFFICE: Engineering Building 207–10527 OFFICE HOURS: 12:00–12:50pm (M/W); or by appointment.
<b>Textbook</b>	<i>Probability and Statistical Inference</i> by Hogg, Tanis, and Zimmerman. Pearson, 10th edition (2024).
<b>Web Page</b>	<a href="https://AppliedStat.GitHub.io/class/">https://AppliedStat.GitHub.io/class/</a>
<b>Software</b>	<i>R Language</i> ( <a href="http://www.r-project.org">http://www.r-project.org</a> ). <i>Maple</i> ( <a href="http://www.maplesoft.com">http://www.maplesoft.com</a> ).
<b>Prerequisite</b>	The expectation is that you have already been exposed to the basic probability and statistics.

## 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

The final grade will be curved and calculated as follows.

HOMEWORKS:	5%
ATTENDANCE:	5% (will be checked at random and count 3 points)
MIDTERM:	45%
FINAL:	45%

#### 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: T.B.A.      In class  
FINAL:      T.B.A.      In class

- All the exams are closed-book and in class.
- 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 **not** allowed.
- 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 submitted 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.