Engineering Statistics–II

IE-24211, FALL 2019

Engineering Building #6, Rm. 6303, Mon/Wed 9:00–10:15am

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); 18:00–18:30pm (M/W); or by appointment.
(No 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 Engineering Statistics–I is required. (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 the 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–II course will focus on advanced theories of probability and their applications.

– Topics covered in this class include distribution theories with several variables, point estimation, interval estimation, and statistical hypothesis test, 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 probability and statistics theories.
- Obtain point estimates.
- Obtain interval estimates.
- Understand basic sampling techniques.
- Obtain a simple linear regression estimate.
- Construct various statistical hypothesis testing.
- Learn how to program basic statistical programs using R language.

Grading The final grade will be curved and calculated as follows:

HOMEWORKS:	5%
ATTENDANCE:	5% (will be checked at random and can 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.

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 exams will be closed-book.
– For the final exam (not for the midterms), you are allowed to bring in *one* A4-size formula sheet made up by yourself.
– 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 $1 \sim 2$ 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 Reviews on Engineering Statistics–I.
2 Distributions with several random variables.
3 The central limit theorem.
4 Introduction to point estimation.
5 Descriptive statistics.
6 Order statistics.
7 MLE (Maximum Likelihood Estimation).
8 Simple regression model
9 Introduction to confidence interval.
10 Confidence interval for means.
11 Confidence interval for the difference of two means.
12 Confidence interval for proportions.
13 Introduction to statistical hypothesis test.
14 Statistical hypothesis test about one or two means.
15 Statistical hypothesis test about proportions.
16 Final Exam