[Updated: September 1st, 2016]

Week 1. Overview

Welcome to the fifth class of ENV1001, Probability and Statistics. This is a three credited course. The instructor is Choi Kwanghoon, who is an associate professor at Department of Electronics and Computer Engineering. My office is Room No.442. This course is one of major core courses. It is also classified as an MSC (Mathematics Science Computer) course required by ABEEK.

Each lecture starts the fourth class on every Tuesday and Thursday. That is, it starts at thirteen thirty, and it ends at fourteen forty-five. The place for lectures is room number 113 in Engineering building 7. The office hour is after each lecture. That is, fourteen forty-five to eighteen on Tuesday and Thursday. The level of this course aims at the second year undergraduates in the division of Software Engineering. It does not require any prerequisites, but it will be good if you are familiar with the basic mathematics: sets(집합), functions(함수), differential and integral calculus(미적분), and permutation and combination(순열과 조합) that you have studied when you were a 1st year undergraduate or a high school student.

This course is about probability and statistics as the title of the course says. Probability and statistics are applied to many areas. Particularly, to Big data and Machine learning. Big data is a technology that enables us to analyze many data in the irregular forms, scattered in the Internet. In 2012, Obama's election camp made use of big data to analyze SNS such as Twitter and Facebook and to establish its winning strategy in the American presidential election. Machine learning is a technology in artificial intelligence for computers to learn something such as recognizing cats in photos. Machine learning heavily depends on probability and statistics. A computer program named Alphago is a very famous application of the machine learning technology to play Go(바둑) and to win over a Korean player, Lee Se-dol by four-to-one in the last five-game match on April 2016.

A theory of probability is a branch of mathematics, which deals with uncertainty. Almost everything that happens in life is uncertain. Whether will it be sunny or rainy today? Will the stock price for a company go higher? Statistics is the study of the analysis and interpretation of data. A theory of probability supports statistical inference; some characteristics inferred from a partial collection of data are consistent with those inferred from a full collection of the data. In this course, we will focus

on basic ideas and concepts of probability and statistics.

A list of objectives of this course is this. As to probability, we study a basic theory of probability with the notion of random variables(확률변수) and distributions(분포). Depending on the nature of domains of interest, we will deal with discrete(이산) and continuous(연속) ones on probability. And then, we study two kinds of statistics: descriptive statistics(기술 통계학) and inferential statistics(추론 통계학).

I run this class with a series of my lectures and your activities. I will distribute slides and lecture notes. You will be graded according to the following criteria. Mid and final exams are 40%, respectively. Homework is 15%. Attendance is 5%. Activities are counted as homework. A main textbook is 공학인증을 위한 확률과 통계(3판), written by 이재원 and 이욱기. The two other books are up to your interest. Finally, this is a weekly plan for the class in this semester.