공업통계특론 (Advanced Engineering Statistics)

유준 교수 (Prof. Jay Liu, jayliu@pknu.ac.kr)

2012 년 1 학기 (spring term, 2012),목 (Thursday) 13:30 ~ 16:20, @4 공학관 210A (4-210A)

강의 소개 (Course Overview)

Objectives:

- ✓ To review fundamental statistical concepts, especially inference and uncertainty
- ✓ To be able to fit models to data and to then judge the appropriateness of the models; the model fitting will cover linear models, nonlinear models and multi-response models.
- ✓ To provide an appreciation for the concepts of statistical process control

Focus:
The presentation of the material will emphasize the use of statistical techniques to extract information from measured data, and the use of this information for decision making. The focus of the course will be on the practical use of various statistical techniques, and this will sometimes demand a close look at the mathematics underlying the techniques so as to understand their strengths and limitations.

선행과목 (Prerequisite)

선형대수 (Linear algebra)

강의 목차 (Course Outline)

The course is divided into 6 main sections.

1. Visualizing data: creating high-density, efficient graphics that highlight the data honestly. (no lecture. Reading materials only)
2. Univariate data analysis: Probability distributions and confidence intervals
3. Process monitoring, aka statistical process control (SPC), for monitoring process behavior.
4. Least squares regression modeling: correlation, covariance, ordinary and multiple least squares models. Enrichment topics will be covered, time permitting.
5. Design and analysis of experimental data and response surface methods for continual process improvement and optimization.

6. [tentative] Introduction to latent variable modeling: a general overview of latent variable models and their use in (chemical) engineering processes.

소프트웨어 (Software)

You can use any statistics software, but some illustrations during lecture will be given using MINITAB®.

평가 (Evaluation)

Assignments (50%), Final Exam (50%)

참고문헌 (References)

You can refer any engineering statistics book.

1. Engineering Statistics by D.C. Montgomery, G.C. Runger, and N.F. Hubele, Wiley
2. Applied Statistics and Probability for Engineers by D.C. Montgomery and G.C. Runger, Wiley.
3. Statistics for Experimenters by G.E.P. Box, W.G. Hunter, and J.S. Hunter, Wiley.
4. Applied Regression Analysis by N.R. Draper and H. Smith,Wiley.