Engineering Statistics

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Textbook: Anderson, Sweeney and Williams, “Statistics”; 第十版
統計學, 陳可杰等譯, 滄海圖書公司 (2009)。

Reference: 統計讓數字說話, Moore, 天下出版。 (basic concept)
統計改變了世界, Salzburg, 天下出版。 (history and contributors)
別讓統計圖表唬弄你, Jones, 天下出版。 (misunderstanding statistics)

Course Outline: (Estimated number of weeks)

1. Data and statistics (1)
2. Descriptive statistics (1)
3. Probability (1)
4. Probability distribution (1)
5. Sample and sampling distribution (1)
6. Interval estimation (1)
7. Hypothesis test (2)
   (Mid-term exam) (1)
8. Inference on means (2)
9. Goodness of fit test (1)
10. Regression (2)
11. Case study presentation (2)
   (Final exam) (1)

Grading:

Assignment 10%
Case study (four to five students per group) 15%
Class quizzes 15%
Mid-term exam 30%
Final exam 30%
Objective
1. understand basic statistics concept, theorem and methods
2. be able to solve statistical problems both manually and by Excel
3. know statistical application to several areas, such as quality control, sampling, design of experiment, marketing research, regression analysis … etc.

Why learn Statistics?
1. open a window to a new world with this applied mathematics
2. expand the interest/specialty on areas such as (1) engineering: quality management, data analysis, design of experiment, (2) management or economics: marketing, econometrics, social-economic analysis
3. subject may be included in graduate school entrance exam.
4. not be cheated by many confusing “STATISTICS”

Tips of good learning
1. do homework personally
2. homework would be assigned basically at the end of most chapters, so need to quickly review chapter content and then do the practice
3. homework will be due a week after announcement, no past due submission is accepted unless you have official approval.
4. do not hesitate to ask questions in class or in TA’s office hour
5. learn outside the class, for example reading reference books, consult teaching assistant about homework, extended study on case, surf on teaching web sites

Note of grading
1. homework is graded by TA, please consult TA in his/her office hour
2. 15% for class quiz, which is to test whether students do homework himself/herself.
3. make good preparation on exam, especially on textbook illustrative examples, and homework. There are two exams, both are 30%.
4. in the exam, you can bring in an A4 single side page of formula, so you do not need to memorize all formula, but still need to be very familiar with them
5. Case study is done by team work. Form the team early, find a good topic, and apply well what you learn from the class. Specific guideline is provided.

What’s next after this course?
1. engineering oriented: quality control, design of experiment, Taguchi method, data mining …
2. management oriented: questionnaire design, marketing research, market survey, regression analysis, finance, econometrics …