實驗設計與統計績效改善 (2004/9)

本課程是以統計理論為基礎之數量課程。探討三大主題：實驗設計 (含變異量分析與多重因子設計)，迴歸模型，反應曲面法。本課程將以整合的線性模型貫穿這些主題，並且說明它們之間的關係。課程的例子包含了商業、經濟與工程上的應用。本課程對研究生而言是極佳的研究方法訓練，對大四學生而言是極佳的統計深度複習，課程著重在觀念解說與軟體系統操作，並且配合有趣的實驗設計加深概念，較無煩瑣之數學推導。

任課老師：郭瑞祥 管院二號館 813 室 (2362-9122) rsguo@ccms.ntu.edu.tw
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上課時間：週一、9:10 - 12:10pm
上課地點：管院 2 館 104 室

教科書

參考書
R. DeVor, Statistical Quality Design and Control, Macmillan, 1992. (華泰書局)

評分
期中考 35% 期末考 20% 學期報告 20% 作業 25%

日期 主題 Reading
9/13 Quality engineering and experimental design Ch. 1
9/20 Simple comparative experiments Ch. 2
Analysis of one-factor experiments Ch. 3.1-3.4
10/4 Analysis of two-factor experiments Ch. 4.1-2, 5
10/11 Two-level factorial design Ch. 6
10/18 Two-level fractional factorial design Ch. 8
10/25 Two-level fractional factorial design Ch. 8
11/1 Blocking and confounding in 2-level factorial design Ch. 7
11/8 Review
11/15 Mid-term exam
11/22 (11am-1pm) Linear regression Ch. 10
11/29 (11am-1pm) Response surface method (I) Ch. 11
12/6 (11am-1pm) Response surface method (II) Ch. 11
12/20 (11am-1pm) Response surface method (III) Ch. 11
12/27 (11am-1pm) Review
1/3 (11am-1pm) Final exam
1/10 (11am-1pm) Students’ presentation
There is a group term paper in this class. In the end of the semester, each group has to submit one written paper. In addition, some groups selected by the instructors need to have oral presentation. Each group should define an experimental design, perform the experiments, and analyze the data.

In the written paper, you should have the following sections:
1. Research motivation and assumptions
2. Experimental design and data collection
3. Detailed analysis and discussion
4. Recommendations
5. References or appendix (optional)

Here are the important dates you need to remember:
12/6  Submit one page of project proposal
12/27 Submit a three-page summary of current project progress and findings
1/3   Instructor announces which four groups to present
1/10  Four groups present their project results
1/17  Hand in one copy of paper (main body no more than 20 pages) and one disk to Prof Guo’s office