Department of Industrial and Information Management-Graduate program

R3008 Design and Analysis of Experiment (實驗設計)
Fall 2012 (101 學年度第 1 學期)

1. This mission of the College is to serve business and society in the global economy through developing professionally qualified and socially responsible business leaders as well as through advancing the frontiers of knowledge in business management.

2. The strategic objective of Department of Industrial and Information Management-Graduate Program /Institute of Information Management is to Cultivate industrial and information management professionals who possess TIP (Technological knowledge, Innovative foundation, and Perceptive learning).

Graduate Program Learning Goals (goals covered by this course are indicated by checks):

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Instructor:
Shine-Der Lee, Ph.D., Professor
Phone: #53146
Email: sdlee@mail.ncku.edu.tw
Class hours: To be announced (Tuesday 8:10-9:00AM, Thursday 10:10-12:00AM)
Office hours: Tuesday 3:00-5:00PM, Thursday 3:00-5:00PM, or by appointment

Course Description:
The knowledge of design of experiment is useful, if not essential, to anyone pursuing graduate work in any of the engineering, management, physical science, or behavioral science fields. Students who work on quality engineering and product (process) design should also benefit from this course.

Course Objectives:
The objective of this course is to provide students with the formal concepts and underlying theories for the design and analysis of experiments. The course is problem oriented and applications of the design are observed. The interplay of design, data, analysis, and results are also stressed to show the iterative nature of both design and experimentation. Topics include: simple comparative experiments, analysis of variance, randomization and blocking, factorial designs, confounding and blocking, fractional factorial designs, regression models, and response surface methodologies. The primary goals of this course are:
To demonstrate the interplay of iterative experimental process, including problem formulation, model building, design, analysis, and implementation, using well-established design and analysis techniques.

To introduce various experimental design techniques for solving a variety of industrial engineering and management science problems.

To establish a solid analytical foundation for advanced study in process design and quality engineering field.

Content Summary:

Topics included but not limited to:
- Administration and introduction (1) (1 week)
- Comparative experiments (1 & 2) (1.5 weeks)
- Analysis of variance + Model adequacy (3) (2.5 weeks)
- Randomized and incomplete block design (4) (2 weeks)
- Factorial design (5) (2 weeks)
- $2^k$ Factorial design & confounding (6+7) (2.5 weeks)
- $2^{k-p}$ Fractional factorial design (8) (2 weeks)
- Fitting regression models (10) (1 week)
- Response surface methodology (11) (2.5 weeks)

Textbook:

Recommended references:

Course Requirement:
- Class rules will be strictly enforced, turn off your electronic devices. Audio-video recording is allowed only with explicit permission from the instructor.
- Homework will be assigned every week. It is due in the first meeting of the coming week. Submit your homework with letter or A4 size papers. No late or sloppy homework will be accepted.
- A term project (An on-hand experiment) in a group of 3 students is designed to complete the course requirement. It is used to re-enforce the learning and the understanding of complex iterative process in experimental designs. Both a complete written report and an oral presentation will be scheduled on 17th week.
- No make up exams
Grading policy:
- Homework 30%
- Mid-term Exam 30%
- Final Exam 30%
- Term project 10%,
- Q&A ±5%

Grading Policy for AACSB Multiple Assessment:

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