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** is to Cultivate industrial and information management professionals who possess TIP (Technological knowledge, Innovative foundation, and Perceptive learning).

**Undergraduate Program Learning Goals** (goals covered by this course are indicated with checks):

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<tr>
<td>✓ 1</td>
<td>Undergraduate students should be able to communicate effectively in speaking and in writing.</td>
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<tr>
<td>✓ 2</td>
<td>Undergraduate students should be able to solve strategic problems with creative and innovative approaches.</td>
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<td>3</td>
<td>Undergraduate students should develop leadership skills required of a person in a leading position.</td>
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<td>Undergraduate students should demonstrate ethical awareness in learning and in social networking.</td>
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<td>Undergraduate students should possess a global perspective and an awareness of the effects of globalization.</td>
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<td>✓ 5</td>
<td>Undergraduate students should acquire the skills and values required of a true professional.</td>
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**Instructor:**

Shine-Der Lee, Ph.D., Professor  
Phone: #53146  
Email: sdlee@mail.ncku.edu.tw  
Class hours/classroom: Monday 9:10-11:00AM, Wednesday 9:10-10:00AM / To be announced  
Office hours: To be announced (Monday 16:00-17:30PM, Wednesday 16:00-17:30PM, or by appointment)

**Prerequisite:**

- Fundamental knowledge in statistics and probability is strongly recommended. Please consult with the instructor for special cases.

**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 problems.
- To establish a solid mathematical 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)

Course Requirement:

- Class rules will be strictly enforced, turn off your electronic devices.
- 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 3~4 students is required to complete the course work. 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 the 17th week.
- No make up exams

Textbook:


Recommended references:

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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<thead>
<tr>
<th>Category</th>
<th>HW 30%</th>
<th>Midterm Exams 30%</th>
<th>Pop Quiz 0%</th>
<th>Final Exam 30%</th>
<th>Essay/Participation 10%</th>
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<td>COMMU</td>
<td>□ Oral Communication/Speaking</td>
<td>□ Written Communication/Writing</td>
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<td>CPSI</td>
<td>■ Creativity and Innovation</td>
<td>■ Problem Solving</td>
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<td>LEAD</td>
<td>□ Leadership</td>
<td>□ Ethic &amp; Social Responsibility</td>
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<td>□ Global Awareness</td>
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<td>■ Values, Skills &amp; Professionalism</td>
<td>□ Technical Skills</td>
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<td>□ Management Skills</td>
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