Department of Industrial and Information Management

R365200 Stochastic Modeling (隨機模式)
Spring 2012 (100 學年度第 2 學期)

This mission 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).

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

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<td>✓</td>
<td>1 Grads should be able to communicate effectively verbally and in writing.</td>
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<td>2 Grads should solve strategic problems with a creative and innovative approach.</td>
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<td>3 Grads should demonstrate leadership skills demanded of a person in authority.</td>
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<td>4 Grads should possess a global economic and management perspective.</td>
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<td>5 Grads should possess the necessary skills and values demanded of a true professional.</td>
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Instructor:
Shine-Der Lee, Ph.D., Professor
Phone: ext. # 53146
Email: sdlee@mail.ncku.edu.tw

Class hours: To be scheduled, (Monday 13:10-15:00PM, Wednesday 15:10-16:00PM)
Office hours: To be announced, (Monday 16:00-17:30PM, Wednesday 16:00-17:30PM, or by appointment)

Course Description:
This is an introductory course of stochastic modeling at the graduate level. The purposes are to introduce students with formal notions of stochastic processes, and to illustrate, explore the rich diversity of stochastic models to appropriate problems for potential applications. This is a lecture-based course that emphasizes on the use of scientific and proven stochastic models for solving related MS/OR problems. Various applications are discussed throughout this course.

Course Objectives:
The primary goals of this course are:
- To demonstrate the interplay of stochastic modelling process, including problem formulation, analytic model building, solution procedures, analysis, and implementation.
- To introduce various stochastic modeling techniques for solving a variety of industrial engineering and management science problems.
- To establish a solid mathematical foundation for advanced study in management science, industrial engineering, and operations management field.
Content Summary:

Topics included but not limited to:
- Administration and introduction (1) (1 week)
- Basis of stochastic modeling (1) (1 week)
- Conditional probability and expectation (2) (2 weeks)
- Markov chains (3) (2 weeks)
- Asymptotic behavior of MC (4) (2 weeks)
- Poisson process (5) (3 weeks)
- Continuous time Markov chains (6) (2 weeks)
- Renewal theory (7) (3 weeks)
- Special topic (modeling & applications) (1 week)

Prerequisite:
- Elementary calculus and probability theories. Consult with instructor for special cases.

Textbooks:

Recommended references:

Course Requirement:
- Class rules will be strictly enforced, turn off your pagers, cellular phones, and electronic devices.
- Homework will be assigned every week. This is a keystone for learning stochastic modeling techniques by doing. Students are encouraged to discuss with others for the modeling process involved, while independent work of each student is expected, in order to achieve the stated learning goals. Each assignment 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 special problem (A scaled-up version of assignment) is given to each student during the last quarter of the semester. This is designed for the students to independently practice the stochastic modeling process learned in the class. A complete written report with oral
discussion is due in the 17th week.
• No make-up Exam

Grading Policy:
• Homework 30%
• Mid-term Exam 30%
• Final Exam 30%
• Special problem (project) 10%
• Q&A, performance improvement +5%

• Grading Policy/評量方式:

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<td>✓ Written Communication</td>
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<td>CPSI</td>
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