

Mathematics 337 “Stochastic Models in Operations Research” - Fall 2006

Instructor:

Troy Day, Room 409 Jeffery Hall; phone: 613-533-2431; email: tday@mast.queensu.ca

Office Hours: Tuesday 2:30-4pm (or by appointment)

Teaching Assistant: TBA

Meeting time & place:

Lectures: Slot 11: (M 11:30-12:30), (T 1:30-2:30), (Th 12:30-1:30)

JEFF 118

Text: Bookstore Notes for MATH 337 (Selections from Introduction to Stochastic Models in Operations Research, by Hillier and Lieberman, plus additional notes by NM Rice).

Course requirements and grading:

- Each Thursday 20%
- Midterm (Oct. 19, 2006) 20%
- Final Exam 60% (or 100% if better than class mark)

General Outline: Most of the topics deal with various situations of trying to describe and predict unpredictable behaviour (stochastic processes), and optimization in the face of uncertainty (stochastic optimization).

Topics:

- **Markov Chains:** For a multi-component system evolving according to fixed transition probabilities, what can be said about long-range behaviour? How can the system be modified to produce desired behaviour?
- **Queuing Theory:** For a queue with one or more servers, what average long-range behaviour is expected? With what variability? How can the system be modified to produce desired behaviour?
- **Dynamic Programming:** What is an efficient method to determine optimal choices in a multi-stage decision network?
- **Inventory Theory:** How do you make your best guess at an optimal choice (e.g. how much inventory to order) when the future is uncertain (e.g. future demand is unknown)?
- **Other possible topics (time permitting)**