OR 647: Queueing Theory
Spring 2010
Course Overview

We are all familiar with waiting in lines – at the grocery store, on the telephone, at the airport, on the road. Queueing theory is the mathematical study of lines. Fundamental questions in queueing theory are:

- What is the average delay?
- What is the probability that delay exceeds a given threshold?
- If the capacity of the system increases, how much does delay decrease?

Answers to these questions provide decision makers a way to efficiently allocate resources to reduce delay. This course provides a survey of quantitative queueing models. The focus is both on mathematical analyses of such models as well as practical issues in using such models to represent real problems. The course assumes prior knowledge of calculus-based probability and continuous-time Markov chains. The pre-requisite is OR 542 (Stochastic Models), or STAT 544 (Applied Probability), or permission of the instructor.

Class Hours: Wednesday, 7:20 pm – 10:00 pm, Robinson Hall B, room 205
Pre-requisites: OR 542, or STAT 544, or permission of instructor

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Textbook: Gross, D., Shortle, J., Thompson, J. Harris, C. 2008. *Fundamentals of Queueing Theory*, 4th ed., Wiley, Hoboken, NJ.

Student Evaluation Criteria

Homework	15%
Project	15%
Midterm	35%
Final exam	35%

OR 647 Schedule
Last updated 1/19/10

Date	Lecture Topic	Assignments
Jan. 20	Introduction to queueing theory Review of stochastic processes	
Jan. 27	Deterministic queueing models	Hmwk #1 due
Feb. 3	Simulation of queueing models	
Feb. 10	Simple Markovian queues	Hmwk #2 due
Feb. 17	Simple Markovian queues	
Feb. 24	Advanced Markovian queues	Hmwk #3 due
Mar. 3	** Midterm **	
Mar. 10	** Spring Break **	
Mar. 17	Advanced Markovian queues	Mini-project due
Mar. 24	Queueing networks	
Mar. 31	Queueing networks	Hmwk #4 due
Apr. 7	Queueing networks	
Apr. 14	Models with general distributions	Hmwk #5 due
Apr. 21	Models with general distributions	
Apr. 28	Advanced topics Review	Hmwk #6 due Mini-project due
May 5	** Final Exam **, 7:30 pm – 10:15 pm	