

OR 647: Queueing Theory

Spring 2009

Course Overview

We are all familiar with waiting in lines (or queues) – at the grocery store, at the airport, in traffic, on the telephone, and so forth. A fundamental issue for any service provider is whether or not to spend more money on resources in order to reduce waiting times for the customers. Queueing theory is the analytical study of these stochastic processes, and it provides the decision maker a way to allocate resources based on quantitative analysis. This course provides a survey of queueing models. The focus is both on mathematical analyses of such models as well as practical issues using such models to represent real problems. This 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: Tuesday, 7:20 pm – 10:00 pm, Enterprise Hall, room 175

Pre-requisites: OR 542, or STAT 544, or permission of instructor

Instructor: John Shortle

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Science & Tech II, room 313

Office hours (or by appointment): Tue 6:15 pm – 7:15 pm, Thu 2 pm – 3pm

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%

Class	Lecture Topic	Homework
Jan. 27	Deterministic queueing models	
Feb. 3	Simulation of queueing models	Hmwk #1 due
Feb. 10	Simple Markovian queues	
Feb. 17	Simple Markovian queues	Hmwk #2 due
Feb. 24	Advanced Markovian queues	
Mar. 3	Advanced Markovian queues	Hmwk #3 due
Mar. 10	** Spring Break	
Mar. 17	Queueing networks	
Mar. 24	Queueing networks	Hmwk #4 due
Mar. 31	** Midterm **	
Apr. 7	Queueing networks	
Apr. 14	Models with general distributions	Hmwk #5 due
Apr. 21	Models with general distributions	
Apr. 28	Advanced topics: Overflow models	Hmwk #6 due
May 5	Advanced topics: Matrix methods	Project due
May 12	** Final Exam **, 7:30 pm – 10:15 pm	