

CS 239 Performance Evaluation of Computer Networks Winter 2004

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Textbook Instructor's handouts
Office hours 11:00am-12:00pm, Surge 346
Class meetings Tuesdays and Thursdays, 3:40 p.m. – 5:00 p.m. Surge 349

Contents

A study of formalisms that can be used to model probabilistic systems, and of the analytical/numerical techniques that can be used for the solution of the resulting models. Particular attention is given to models of computer systems and networks.

- Background:
 - Random variables; probability distributions; expected value.
 - Important distributions (uniform, geometric, exponential, etc.).
 - Joint distributions and independence.
 - Conditional probability and conditional expectation.
 - Stochastic processes: discrete-time and continuous-time Markov chains.
- Queuing systems:
 - Arrival and service processes.
 - Server disciplines.
- Queuing networks:
 - Open vs. closed networks.
 - Product-form queuing networks.
 - The convolution and MVA solution algorithms.
- General models:
 - Extended queueing networks.
 - Stochastic Petri nets.
 - Numerical solution of Markov chains

Prerequisites

Basic concepts of calculus, linear algebra, and discrete mathematics. No probability background is required.

Coursework

Homeworks (around 6): 40% of the grade.
Project: 30% of the grade.
In-class final: 30% of the grade.

If you foresee having to turn in a homework after its due date, or if you must miss an in-class test for justifiable reasons (such as an illness), it is fundamental that you let me know as soon as you can, and certainly before the deadline. Sending me e-mail or coming in person to my office are the best ways to do so.

Grading policy

If your overall grade amounts to $x\%$, your final grade will be determined as follows:

$-\infty \leq x < 57$: F	$57 \leq x < 60$: D-	$60 \leq x < 63$: D
$63 \leq x < 67$: D+	$67 \leq x < 70$: C-	$70 \leq x < 73$: C
$73 \leq x < 77$: C+	$77 \leq x < 80$: B-	$80 \leq x < 83$: B
$83 \leq x < 87$: B+	$87 \leq x < 90$: A-	$90 \leq x < +\infty$: A