

Modeling and Analysis of Communication Networks

ITCS6132/8132 - Fall 2010

Instructors:

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Time and Location: Monday 3:30pm-6:15pm, Woodward 135

Course Website:

The course website is available through **Moodle** (<http://moodle.uncc.edu/>). All the course-related handouts, assignments, and announcements will be posted at the course website. Please check the course website regularly for new information.

Objective:

This course provides the theoretical foundation for performance analysis techniques of communication networks. With such foundation, students will learn how to model and evaluate network systems, switches, routers, etc. The underlying principles of computer systems analysis (which are based on stochastic theory and queueing theory) will be studied. Simulation techniques of communication networks (such as simulation modeling, random number generation, discrete-event simulation, simulation languages and tools) will also be discussed.

Textbook:

L. Kleinrock, “**Queueing Systems, Volume 1, Theory,**” John Wiley & Sons, January 1975. ISBN: 0-471-49110-1

Reference Books:

R. K. Jain, “The Art of Computer Systems Performance Analysis: Techniques for Experimental Design, Measurement, Simulation, and Modeling,” John Wiley & Sons, April 1991. ISBN: 0-471-50336-3

D. Gross and C. M. Harris, "Fundamentals of Queueing Theory," Third Edition, John Wiley & Sons, 1998, ISBN:0-471-17083-6

Prerequisites:

Students are expected to have a basic understanding of the fundamental concepts of computer networks. An undergraduate course on probability is helpful.

Grading:

There are 3-5 homework assignments, 2-3 programming projects, a midterm, and a final exam (or a presentation), required for this course. They will count toward the grade as follows:

Homework:	30%	Project:	20%
Midterm:	30%	Final/Presentation:	20%

The instructor reserves the right to make adjustments to these weights based on her/his a posteriori evaluation of the relative difficulty and fairness of the exams and homework.

Tentative Course Outline:

- Probability Theory Refresher
- Overview of Queueing System
- Random Processes
- Queueing Systems: M/M/1 queue, M/M/1/K queue, M/M/c, M/M/infinity queue, M/M/1/K/K queue
- Introduction of Simulation
- Random-Number Generation
- Network Simulator (NS-2)

Course Policies:

- Class attendance is a responsibility of each individual. If a student chooses not to attend class, he/she is responsible for any handouts, announcement, and contents of missed lectures.
- There will be **no make-up exams**. Students who cannot attend an exam with health emergency must show official proofs.
- Assignments are due at the beginning of the class. Assignments will be graded and solutions will be provided. Late assignments are not accepted and will have a **grade of zero**.

Students with Disabilities:

Students in this course seeking accommodations to disabilities must first consult with the [Office of Disability Services](#) and follow the instructions of that office for obtaining accommodations.

Academic Integrity:

All students are required to read and abide by the Code of Student Academic Integrity. Violations of the Code of Student Academic Integrity, including plagiarism, will result in disciplinary action as provided in the Code. Definitions and examples of plagiarism are set forth in the Code. The Code is available from the Dean of Students Office on online at <http://www.legal.uncc.edu/policies/ps-105.html>

Note:

The standards and requirements set forth in this syllabus may be modified at any time by the course instructor. Notice of such changes will be by announcement in class.