

CSc82005 – Advanced Computer Networks
Computer Science PhD Program
Graduate Center, City University of New York
Fall 2007

Meeting Time & Place: Wednesday, 11:45am – 1:45pm, Room TBA

Instructor: Prof. Ping Ji

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Office Hour: Wednesday, 2:00 – 3:00pm, or by appointment.

Text Book: There is NO specific text book for this course. Reading materials will be assigned through the semester. A recommended book reading is: *Computer Networking: A Top-Down Approach Featuring the Internet*, by James F. Kurose and Keith W. Ross, Addison Wesley, 3rd Edition, ISBN: 0-321-22735-2

Class Website: <http://web.jjay.cuny.edu/~pji/csc82005.html>

Course Description: This course is designed for graduate students in Computer Science programs who have knowledge in undergraduate level Computer Networks, Algorithms and some familiarity with probability theory. This course covers advanced fundamental principles of computer networks design and evaluation. Topics include protocol mechanisms, advanced network architecture, routing algorithms, network simulation schemes, network measurement and traffic analysis approaches, performance evaluation, and other state-of-art network research and applications. A brief outline of the topics is as follows:

Protocol Mechanisms: common protocol design and implementation techniques: signaling, randomization, multiplexing, scalability, indirection, virtualization

Network architecture: Principles of Circuit Switching and Packet Switching. Lessons learned for the Internet, ATM networks, Telephone networks.

Router design and Routing algorithms: Input/Output queuing, Packet classification, Scheduling, Multicast routing, Content based routing, ad hoc routing, etc

Network Measurement: Workload models; traffic and topology characterization, traffic sampling, network tomography.

Network Simulations (if time permits): Principles of discrete event simulation, Analysis of simulation output, Simulation pitfalls, The NS simulator

Performance Evaluation (if time permits): Introduction to simple queuing models (M/M/1), closed loop system models

Course Workload: The course workload and grading scales are specified in the following table. Please note, not finishing ANY of the course work will result in an INC or an F in final grade.

Written assignments	3-4 times	40%
Midterm	1	30%
Final project/Exam	1	30%

Comments: pji@jjay.cuny.edu