EEL 6785: Computer Network Design

Semester: Fall 2009, Credits: 3
Instructor: Mainak Chatterjee
Office: HEC (Engr III); Room 305
Class Time: Monday & Wednesday 6:00-7:15 PM
Venue: Engr I; Room 388
Office hours: Mon and Wed 4:00-5:30 PM
http://www.eecs.ucf.edu/~mainak/COURSES/fall09

Catalog Information: Network types and network protocols. Design of networks and analysis of their performance.

Course Outline: The goal for this class is to give the students a well rounded knowledge of the concepts underlying modern computer networks with particular emphasis on the Internet. Though the course will evolve during the semester, the topics to be covered are as follows.

Protocol layering
Network design principles and methodology
Application level network protocols
TCP/IP
Congestion control and flow control
Delay analysis and Queuing theory (M/M/1)
MAC layer protocols
Wireless networks

Reference:
1. Kurose and Ross, *Computer Networking: A top down approach*, Addison-Wesley. (5^{th} edition is now available). Older editions will also suffice.
Slides available: http://www.eecs.ucf.edu/~mainak/KUROSE-ROSS/

2. Dmitri Bertsekas and Robert Gallager, *Data Networks*, 2nd ed. Prentice Hall.

Pre-requisites: Some programming skills (C/C++/Java), Probability theory.

Grading Policy: Assignments (1 programming + 3 theory): 40%, Mid-term: 30% and Final exam: 30%. The assignments are due at the start of the class (6:00 PM) on the due date. The solutions will be discussed in the class soon after the due time. Hence, late submissions do not make sense. There are no projects/presentations for this course. Plus minus will be used for grades.

Plagiarism: Will result in 0 (zero) points for the concerned homework. Repeated occurrence will fetch 'F' grade for the course.

Mid-term: Oct 14^{th}, during class hours
Final exam: As per UCF final exam schedule – Dec 9^{th} (4:00 – 6:50 PM)

Tentative Schedule

Aug 24: Introduction to the course
Aug 26: Overview
Aug 31: Circuit/Packet Switching
Sep 02:
Sep 07: Holiday (Labor Day)
Sep 09:
Sep 14: HW 1 due
Sep 16:
Sep 21:
Sep 23:
Sep 28:
Sep 30:
Oct 05: HW 2 due
Oct 07:
Oct 12: Review for Mid term
Oct 14: Mid term exam (during class hours)
Oct 19:
Oct 21:
Oct 26:
Oct 28:
Nov 02:
Nov 04: HW 3 due
Nov 09:
Nov 11: Holiday (Veteran's Day)
Nov 16:
Nov 18:
Nov 23:
Nov 25:
Nov 30: HW 4 due
Dec 02:
Dec 07: Review for Final exam
Dec 09: Final exam (4:00 – 6:50 PM)

Topics before mid-term: Circuit and Packet switching, Transport layer mechanisms, TCP, UDP, Graphs and topologies, Routing algorithms, Network layer, Network flows, Content distribution networks, peer-to-peer networks.

Topics after mid-term: IP, Random variables, Little's Law, Queuing models (M/M/1), Markov chains, MAC protocols, multimedia networking, wireless networks.

Note: Slides will be put up `before' the lecture. If you do not find slides linked for any topic, it means that the board will be used. It is your responsibility to get the class notes.

Note: Students registered for the LECTURE section must take the exams in-class. FEEDS students have the option of taking the exams in-class or at the campus they are registered with. It is the responsibility of the student to arrange for a proctor (see UCF guidelines) for non in-class exam during the same time/day of the in-class exam.