SYLLABUS

COURSE: ENEE 756 COMPUTER NETWORKS

TERM: Fall 2008

INSTRUCTOR: Dr. Charles B. Silio

Office Hours: Tues. & Thurs 8 – 9 a.m., & 11 a.m. – 12 noon; otherwise, by appointment.

Course Days/Times: Tues. & Thurs.: 9:30 – 10:45 a.m. in room CSI 2118

CREDIT HRS: 3

COURSE LEVEL: Graduate

PREREQUISITES: Knowledge of probability theory (ENEE 324 or equivalent) and digital computer architecture/design (e.g., ENEE 446 or ENEE 646).

REQUIRED TEXTBOOK:

COURSE OBJECTIVES:
To study the principles, design, evaluation, and use of computer networks, especially local area networks and high speed ring networks.

COURSE DESCRIPTION:
This course will cover various aspects of computer networks including the network architecture, protocol layers, channel coding, data communication concepts, local area network (LAN) topologies and transmission media, basic queueing theory applied to LAN performance modeling, LAN access techniques, network interconnections, network reliability, and network security. Recent performance analysis work in the area of token and circuit-switched rings and reliability of fiber optic ring networks will also be covered.

TOPICAL OUTLINE:
I. Network Architecture
II. Physical Layer, digital communication, coding modulation, and media
III. Data Link Layer and Medium Access Control protocols, framing and reliable transmission
IV. Network Layer, packet switching, virtual circuits, datagrams, bridges, and LAN switches
V. Local Area Networks (e.g., IEEE 802, FDDI, Ethernets)
VI. Self-similar traffic, performance models and comparisons
VII. Internetworking, IP, and routing
VIII. End-to-end protocols, Transport Layer, TCP, UDP, RPC, congestion control
IX. Higher Layers, end-to-end data, and applications
X. Network reliability

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COURSE REQUIREMENTS: Homework, Exams, Term Paper/Project

HOMEWORK: (assigned, solutions provided, not marked)

EXAMS: two 75 minute exams (33.3% each)
   Exam I (Thurs., Oct. 16) and Exam II (Tues., Dec. 16) (Tentative dates)

TERM PAPER/PROJECT: (33.3%)

Term Paper/Project Requirements:
Each student can choose to write a term paper or do a group project.

Term Paper:
For a term paper an individual student will choose a topic in networking, will research literature on the topic and write a term paper on the subject. The term paper must present a tutorial introduction to the topic, summarize the state of research specifying those problems that have been solved and identifying remaining open problems.

Project:
For a project students will form a group of no more than three students, do a project and write a project report. Course projects would typically involve the modeling of network systems and their performance evaluation by analysis and/or simulations.

Term Paper/Project Schedule:
   proposal version 1, Tues., Oct. 7
   proposal final version, Thurs., Nov. 6
   final paper/report, Tues., Nov. 18

COURSE ORGANIZATION: The course is largely lecture/discussion oriented. The two exams and the term paper/project are weighted about one-third each. For the first 11 to 12 weeks regular lectures will be held. Then the students will make presentations about their term paper/project. Students will chose a topic from a list to be provided or will make a reasonable alternate proposal. An outline with bibliography is due in about 4 weeks and the report is due in approximately 11 weeks.

REFERENCES: