SYLLABUS

COURSE: ENEE 756 COMPUTER NETWORKS  TERM: Fall 2004

INSTRUCTOR: Dr. Charles B. Silio
Office Hours: Wed. 2–3:50 p.m., Mon. & Fri. 11 a.m.–12 noon; otherwise, by appointment.
Course Days/Times Meet on Campus: Mon. & Wed.: 12:30–1:45 p.m.
CREDIT HRS: 3  COURSE LEVEL: Graduate

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

REQUIRED TEXTBOOK:

RECOMMENDED ADDITIONAL 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 ISO open systems reference model, 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. Layered Network Architecture (OSI Model vs. TCP/IP)
II. Physical Layer, digital communication, coding modulation, and media
III. Data Link Layer and Medium Access Control protocols
IV. Network Layer, Virtual Circuits and Datagrams, and Routing
V. Local Area Networks (IEEE 802 and FDDI)
VI. Ring networks versus CSMA/CD, performance models and comparisons
VII. Internetworking and IP
VIII. Transport Layer and TCP
IX. Higher Layers
X. Network Reliability

-continued-
COURSE REQUIREMENTS: Homework, Exams, Term Paper/Project

HOMEWORK: (approx. 10% if grader available)

EXAMS: two 75 minute exams (approx. 30% each (or 33% w/o grader))
Exam I (Mon., Oct. 18) and Exam II (Wed., Dec. 8) (Tentative dates)

TERM PAPER/PROJECT: (approx. 30% (or 33% w/o grader))

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, Wed., Sep. 29
- final paper/report, Mon., Nov. 8

COURSE ORGANIZATION: The course is largely lecture/discussion oriented. The two exams
the term paper/project are weighted about one-third each. The term paper/project is an important
part of the course. 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 10 weeks.

REFERENCES:
1. W. Stallings, High Speed Networks, TCP/IP and ATM Design Principles, Upper Saddle River,
3. J. L. Hammond and P. J. P. O’Reilly, Performance Analysis of Local Computer Networks,
4. B. Albert and A. P. Jayasumana, FDDI and FDDI-II Architecture, Protocols, and Performance,
033561-3.
pp. 504-511.


