

UNIVERSITY OF DETROIT MERCY
COLLEGE OF ENGINEERING AND SCIENCE
ELECTRICAL ENGINEERING DEPARTMENT

TERM I, 1999

EE 468 - COMPUTER NETWORKS

Course Description: In this course, we will study computer networks and distributed computing systems. We will discuss topics ranging from the transmission of data across physical communication media to contemporary distributed computing environments.

Prerequisites by topic:

1. Computer Organization and Architecture
2. Programming Language

Objective: The objective of this course is to introduce students to Computer Networks including LAN, MAN, WAN, Internetworking and their applications. Students will use COMNET III Simulation tool to evaluate different network designs and topologies.

Textbook: Computer Networks and Internets, Prentice Hall, Douglas Comer, 19996.

References: Internetworking with TCP/IP , Prentice Hall, Douglas Comer, Vol. 1,2 & 3, 1996.

Data Communication, Computer Networks, and Open
Systems, Halsall, Addison Wesley, 1996.

TCP/IP Illustrated, Addison Wesley, W. R. Stevens, Vol.
1,2 & 3, 1994.

Computer Networks, Prentice Hall, Tanenbaum, 1996

Instructor: Dr. Nizar Al-Holou, Professor

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Course Web page: <http://eng-sci.udmercy.edu/personal/alholoun/>

Office Hours: 3:00 – 6:00 P.M. T, TH

Lecture: 6:35 – 7:50 P.M. T, TH

Computer Usage: You will use COMNET II in the ECE lab to simulate different network architectures and evaluate their performances. The reports must be submitted in hard and soft copy.

Grading:

1. Midterm Exam (10/19/99) 20%
2. Final (12/14/99) 35%
3. Project 30%
4. Homework and labs 15%

[No late homework or make-up exam exceptions make only under compelling circumstances]

Grading: 100-93% = A 78-79% = C+

92-90% = A⁻

73-77% = C

88-89% = B⁺

70-72% = C⁻

83-87% = B

60-69% = D

80-82% = B⁻

Below 60%=F

[Deadline to "Delete" a course is Oct 1, 1999 to "Withdrawal" from a course is November 24, 1999]

Topics:

1. Data Transmission
2. Transmission Media

3. Local Asynchronous Communication (RS-232)
4. Long-Distance Communication (Carriers and Modems)
5. Packet Transmission
6. Packets, Frames, And Error Detection
7. LAN Technologies and Network Topology
8. Hardware Addressing and Frame Type Identification
8. LAN Wiring, Physical Topology, And Interface Hardware
9. Extending LANs: Fiber Modems, Repeaters, Bridges, and Switches
10. WAN Technologies and Routing
11. Network Ownership, Service Paradigm, And Performance
12. Protocols and Layering
13. Internetworking: Concepts, Architecture, and Protocols
14. IP: Internet Protocol Addresses
15. Binding Protocol Addresses (ARP)
16. IP Datagrams and Datagram Forwarding
17. IP Encapsulation, Fragmentation, And Reassembly
18. The Future IP (IPv6)
19. Error Reporting Mechanism (ICMP)
20. TCP: Reliable Transport Service
21. Client-Server Interaction
22. The Socket Interface
23. Example of A Client and A Server

- 24. Naming With the Domain Name System
- 25. Electronic Mail Representation And Transfer
- 26. File Transfer And Remote File Access
- 27. World Wide Web Pages and Browsing

Project

The most significant work you will do in this course will be a semester project, which will count as 30% of your grade. The project consists of two phases:

Phase I:

- Select a home page for Data Communication and/or Networking classes, Network Infrastructure, Networking Company such as Lucent, SYSCO that relates to education
- Page overview
- Network Infrastructure
- Course Notes and Animations
- Programming Examples
- Student/ Research Projects

The sooner you select a home page, I'll reserve it for you. It must be done by 9-21-99.

The presentation is scheduled on 10-5-99 with a report.

Phase II

- Select a project for your group. The project should be about a network and may include:
 - Design issues, software implementation, evaluation and demonstration:
 - Development of Client and Server in Windows/Unix Environments,
 - Compression Algorithms,
 - Development of Routing Algorithm Using Graph Theory,
 - Fuzzy logic based routing,
 - Multimedia Development, or

- Java Script that implement networking concepts or different routing algorithms
- Title and summary of Project is due 10/29/99
- Presentation and report is due 12-3-99