
CIS 777

Telecommunications

Networks

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These slides are available at:

<http://www.cis.ohio-state.edu/~jain/cis777-99/>



How

What

When

Why



How am I going to grade you?

What are **we** going to cover?

When are **you** going to do it?

Why you should **not** take this course?

Grading

Quizzes (Best 2 of 3)	50%
Class participation	10%
Homeworks+Labs	40%

- The division of grades between homeworks and labs will depend on the number of labs
- Most likely it will be 20% for homeworks and 20% for labs.

Frequently Asked Questions

Yes, I do use “curve”. Your grade depends upon the performance of the rest of the class.

All homeworks are due at the beginning of the next class.

All late submissions must be preapproved.

All quizzes are open-book and extremely time limited.

Quizzes consist of numerical as well as multiple-choice (true-false) questions.

There is negative grading on incorrect multiple-choice questions.

Everyone including the graduating seniors are graded the same way.

Text Book

J. Black, "Emerging Communications Technologies", Prentice-Hall, 2nd Ed, 1997, ISBN 0-13-742834-0, 458 pp.

G. Sackett and C. Y. Metz, "ATM and Multiprotocol Networking," McGraw-Hill, 1997, ISBN 0-07-057724-2, 342 pp.

Supplementary Texts

W. Stallings, "ISDN and Broadband ISDN with Frame Relay and ATM," **3rd Ed.**, Prentice-Hall, 1995, ISBN 0-02-415513-6, 581 pp.

H. J. R. Dutton and P. Lenhard, "Asynchronous Transfer Mode (ATM): Technical Overview," **2nd Ed**, Prentice-Hall, 1995, ISBN 0-13-520446-1.

3. Dorling, et al, "Internetworking over ATM," Prentice-Hall, 1996.

Prerequisite: CIS677

Protocol Layers: ISO/OSI reference model

Physical Layer: Coding, Manchester

Transmission Media: UTP, Cat 5, Microwave, Radio

Data Communication: Asynchronous vs synchronous
Baud, bit, and Hz, Half-Duplex vs Full-duplex,
Modulation/Demodulation

Packet Transmissions: Framing, Bit stuffing, byte stuffing

Flow Control: On-Off, Window

Error Detection: Parity, Checksum, Cyclic Redundancy

Check

Prerequisites (Cont)

Error Recovery: Start and Stop,
Go back n , Selective Reject

LANs: Aloha, CSMA/CD, Ethernet,
IEEE 802.3, Token Ring/IEEE 802.5, FDDI

LAN Addressing: Unicast vs multicast, Local vs Global

LAN wiring: 10Base5, 10Base2, 10Base-T, 100Base
T4, 100Base-TX, 100Base-FX

Extended LANs: Hubs, Bridges, Routers, Switches

Routing: Distance Vector vs Link State, Spanning tree
source routing

Network Layer: Connectionless vs connection oriented

Schedule (Tentative)

0/99 Overview

/99 A Review of Networking Concepts

/99 Fundamentals of Telecommunications

/99 X.25

3/99 Frame Relay

5/99 Quiz 1

0/99 Frame Relay Congestion Control

2/99 ISDN

7/99 SONET

Schedule (Cont)

9/99 Introduction to ATM

/99 ATM Traffic Management

/99 Quiz 2

1/99 IP Over ATM

3/99 PNNI: Routing in ATM Networks

8/99 ATM Signaling

0/99 Wireless Data Networking 1

5/99 Wireless Data Networking 2

7/99 Quiz 3

/99 Graduating Seniors' grades due

io State University

Raj .

Office Hours

Tuesday: 2:00 to 2:30 PM

Thursday: 2:00 to 2:30 PM

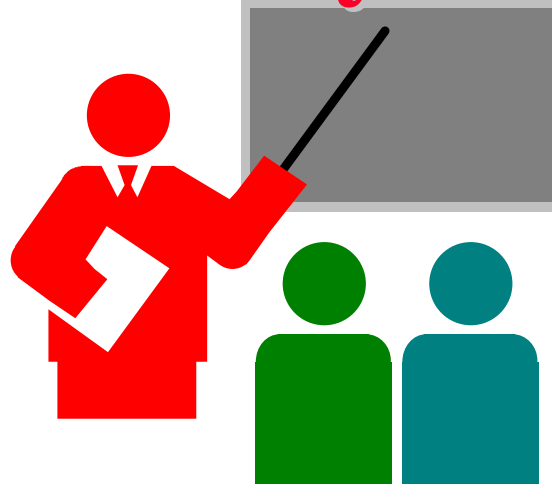
Office: 297 Dreese Lab, 2015 Neil Ave

GTA: Arian Durrese, DL299

Durrese@cis.ohio-state.edu

MWF 11:30-12:30

Summary



There will be a lot of self-reading

Goal: To prepare you for a career in networking

Get ready to work hard

Quiz 0: Prerequisites

or False?

Datalink refers to the 2nd layer in the ISO/OSI reference model

Category 5 unshielded twisted pair cable is better than category 4 unshielded twisted pair cable.

Finding path from one node to another in a large network is a transport layer function

It is impossible to send 3000 bits/second through a wire which has a bandwidth of 3000 Hz.

Bit stuffing is used so that characters used for framing do not occur in the data part of the frame.

For long delay paths, on-off flow control is better than window flow control.

Ethernet uses a CSMA/CD access method.

10Base2 runs at 2 Mbps.

The packets sent in a connection-oriented network are called datagrams.

Spanning tree algorithm is used to find a loop free path in a network.

Score = Correct Answers _____ - Incorrect Answers _____ = _____

Homework 1

From Tanenbaum's book, review sections
1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3,
3.4, 3.6.1

or

From Stallings' book, review sections 1.4, 15.2, 15.3,
2.3, 3.1, 4.1, 6.1-6.4, 9.2

Submit answers to exercises on the next slide

Due Date: Tuesday, April 6, 1999.

Homework 1 (Cont)

A system has n layer protocol hierarchy. Applications generated messages of length M bytes. At each of the layers, a 1-byte header is added. What fraction of the network bandwidth is filled with headers.

If the bit string 01110111110111110 is bit stuffed, what is the output string (on wire).

Two stations communicate via a 1-Mbps satellite link with a propagation delay of 270 ms. Using HDLC frames of 1024 bits with 3-bit sequence numbers, what is the maximum possible data throughput (excluding the overhead bits)?

Homework 2

From Tanenbaum's book, review sections
4.3, 4.4, 4.5, 5.2, 5.5.1, 5.5.2, 5.5.3, 6.4

or

From Stallings' book, review sections 12.1-12.4, 13.1-13.2, 14.1, 14.2, 15.3, 16.3, 17.3, 17.4

Submit answers to exercises on the next slide

Due Date: Thursday, April 8, 1999

Homework 2 (Cont)

Consider a baseband bus with a number of equally spaced stations with a data rate of 10 Mbps and a bus length of 1 km. What is the average time to send a frame of 1000 bits to another station, measured from the beginning of the transmission to the end of reception? Assume a propagation speed of 200 m/ μ s

A class B network on the Internet has a subnet mask of 255.255.240.0. What is the maximum number of hosts per subnet.

What is the maximum payload of a TCP segment?