91.413 Data Communications I

- Texts:
  - Kurose and Ross: Computer Networking, 3rd edition, 2004
  - Liebeherr and El Zarki: Mastering Networks, 2004

- Course page: http://www.cs.uml.edu/~tom

Part 1: Introduction

What is the Internet, What is a protocol?
The Network Edge, Core, and Access Networks
Physical Media
Delay and Loss in Packet-Switched Networks
Protocol Layers and Their Service Models
Internet Backbones, NAPs and ISPs
A Brief History of Computer Networking and the Internet

Part 2: The Application Layer

Principles of Application-Layer Protocols
The World Wide Web: HTTP
File Transfer: FTP
Electronic Mail in the Internet
The Internet's Directory Service: DNS
Socket Programming

PROGRAMMING ASSIGNMENT 1

Part 3: The Transport Layer

Transport-Layer Services and Principles
Multiplexing and Demultiplexing Applications
Connectionless Transport: UDP
Principles of Reliable of Data Transfer
TCP case study

PROGRAMMING ASSIGNMENT 2
Principles of Congestion Control
TCP Congestion Control

MIDTERM EXAM
Part 4: The Network Layer

Introduction and Network Service Model
Routing Principles
PROGRAMMING ASSIGNMENT 3
Hierarchical Routing
IP: the Internet Protocol
Routing in the Internet
What is Inside a Router?

Part 5: The Link Layer and Local Area Networks

The Data Link Layer: Introduction, Services
Error Detection and Correction
Multiple Access Protocols and LANs
LAN Addresses and ARP
Ethernet
Hubs, Bridges and Switches
Wireless LANs: IEEE 802.11
PPP: the Point-to-Point Protocol
ATM

Part 6: Security in Computer Networks

What is Network Security?
Principles of Cryptography
Authentication: Who are You?
Integrity
Key Distribution and Certification

Part 7: Network Management

What is Network Management?
The Internet Network Management Framework
ASN.1
Firewalls
Part 8: Additional Topics

Multimedia Networking Applications
Quality of Service
Wireless Application Protocol
Student-Suggested Topics

• FINAL EXAM