CISC 3345: Computer Networks
Text: Data and Computer Communications, 10th ed.
Reference Text: Computer Networking with Internet Protocols and Technology by - W. Stallings (Pearson/Prentice-Hall)

Course Outline

1. Introduction to Computer Networks

Chapter 1:
Chapter 9: (Section 9.1-9.5) Review Questions: 9.1 thru 9.7; HW Problems: 9.7, 9.8
- Station Interconnection
- Switched Communications Networks
- Circuit Switching vs. Packet Switching Networks
- Packet Switching Alternatives
- Frame Relay and ATM Networks
- Broadcast Networks: Satellite Networks, Radio Networks, LANs
- The Internet
- Intranets and Extranets

2. Protocols

Chapter 2: Review Questions: 2.1 thru 2.11; HW Problems: 2.2, 2.5, 2.6, 2.7
Appendix E: The OSI Model
Appendix O: TCP/IP Example
- Protocol Concepts & Functions
- A Simple Protocol Architecture
- The TCP/IP Protocol Architecture
- Protocol Implementation
- TCP/IP Sample Configuration
- Traditional vs, Multimedia Internet Applications

3. Internetworking

Chapter 14: Review Questions: All; HW:14.2, 14.3, 14.6, 14.9, 14.10, 14.12, 14.22
Chapter 21: Review Questions: All; HW:21.5, 21.9, 21.14. 21.15
Chapter 22: Review Questions: All, HW:22.3, 22.4, 22.5
Chapter 23: Review Questions: All, HW 23.2
Chapter 27 (Section 27.1) Review Question: 27.1; HW: 27.1
Chapter 11 (section 11.3): Review Question: 11.8
- Principles of Internetworking
- Approaches
- Internet Protocols: IP, ICMP
- IPv6, ICMPv6
- Internet Routing: ARP, RIP, OSPF, EGP, BGP
- Virtual Private Networks
- IP Security (IPSec) Standards
- Multicasting
- Mobile IP
- Integrated Services Architecture
- Resource Reservation Protocol (RSVP)
- Differentiated Services
- Multiprotocol Label Switching

Exam #1

4. Transport Protocols

Chapter 15: Review Questions: All; HW: 15.3, 15.5, 15.6, 15.7, 15.10, 15.13, 15.15, 15.16, 15.17, 15.18
Chapter 7 (Reference Text - Section 7.3):
Chapter 25 (Section 25.4): Review Questions: 25.6, 25.7; HW: 25.3, 25.4
- Transport Layer Issues
- The Transmission Control Protocol (TCP)
- TCP Mechanisms, Policies, and Traffic Control
- The User Datagram Protocol (UDP)
- Real-Time Transport Protocol (RTP)

5. Application Protocols

Chapter 24: Review Questions: All; HW: 24.2, 24.3, 24.4, 24.9, 24.10, 24.11
Chapter 3 (Reference Text): Link to Review Questions and HW
Review Questions: 3.1 thru 3.11; HW: 3.1, 3.2
Chapter 2 (Appendix): HW: 2.13, 2.15
Appendix R:
- The Client-Server Paradigm
- Directory Services: DNS
- Remote Login: TELNET, SSH
- File Transfer: FTP
- Trivial File Transfer Protocol (TFTP)
- Electronic Mail: SMTP, MIME, POP
- Universal Resource Locators (URLs)
- Hypertext Transfer Protocol (HTTP)

6. Multimedia Protocols

Chapter 25 (Sections 25.1-25.3): Review Questions: 25 .1 thru 25.5
- Real-Time Traffic
- Session Initiation Protocol (SIP)
- VoIP (Voice over IP) and other Multimedia Applications

7. Legacy Networks

Appendix U:
- X.25 Network Access
- Frame Relay Networks
- Frame Relay Congestion Control

8. ATM (Asynchronous Transfer Mode) Networks

Chapter 9 (Section 9.6): Review Questions: 9.8-9.10
Chapter 8 (Section 8.2 pp.256-259)
Appendix V:
- ATM Protocol Architecture
- ATM Logical Connections
- ATM Cells
- Transmission of ATM Cells
- ATM Service Categories
- ATM Traffic Management

Exam #2

9. Wireless LAN Networks

Chapters 11: Review Questions: All
Chapters 12: Review Questions: 12.1 thru12.4
Chapters 13: Review Questions: All; HW 13.1
Chapter 17 (reading only): Review Question: All
- Legacy LAN Networks: Ethernet, ...
- Wireless LAN Technology
- Spread Spectrum Technology
- IEEE 802.11 Architecture and Services
- IEEE 802.11 MAC Layer
- IEEE 802.11 Physical Layer
- IEEE 802.11 Security Considerations

10. Computer and Network Security

Chapters 26: Review Questions: All; HW: 26.1, 26.3, 26.5
Chapters 27: Review Questions: All
- Computer Security Concepts
- Threats, Attacks, and Assets
- Intruders
- Malicious Software Overview: Viruses, Worms, Bots, etc.
- VPNs and IPsec
- SSL and TLS
- WiFi Protected Access
- Intrusion Detection
- Firewalls
- Malware Defense

Final Examination