

CIS 49.2: Computer Networks
Text: Data and Computer Communications, 8th 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 10 (Sections 10.1-10.5):

Review Questions: 10.1 thru 10.7; HW Problems: 10.5, 10.6

- 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 2.8; HW Problems: 2.2, 2.5, 2.6

- Protocol Concepts & Functions
- The OSI Reference Model
- The TCP/IP Protocol Architecture
- Protocol Implementation
- TCP/IP Sample Configuration
- Traditional vs. Multimedia Internet Applications

3. Internetworking

Chapter 18: Review Questions: All; HW: 18.2, 18.3, 18.6, 18.10, 18.12, 18.22

Chapter 19 (Sections 19.1-19.2): Review Questions: 19.1 thru 19.6

Chapter 21 (Section 21.6) Review Question: 21.15; HW: 21.13

Chapter 15 (section 15.4): Review Questions: 15.10

- Requirements
- Approaches: Routers, Bridges, etc.
- Internet Protocols: IP, ICMP
- IPv6, ICMPv6
- Internet Routing: ARP, RIP, OSPF, EGP, BGP
- Virtual Private Networks
- IP Security (IPSec) Standards

4. Transport Protocols

Chapter 20: Review Questions: All; HW: 20.3, 20.5, 20.6, 20.7, 20.10, 20.13

Chapter 7 (Reference Text - Section 7.3):

Chapter 24 (Section 24.4): Review Questions: 24.7, 24.8; HW: 24.4

- Transport Layer Issues
- The Transmission Control Protocol (TCP)
- TCP Mechanisms, Policies, and Traffic Control
- The User Datagram Protocol (UDP)
- Real-Time Transport Protocol (RTP)

Exam #1

5. Application Protocols

Chapter 23 (Section 23.1):

Review Questions: 23.1 thru 23.6; HW: 23.1, 23.2, 23.12

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):

Chapter 22: Review Questions: 22.2 thru 22.4; HW: 22.3, 22.4

- The Client-Server Paradigm
- Directory Services: DNS
- Remote Login: TELNET
- File Transfer: FTP
- Trivial File Transfer Protocol (TFTP)
- Electronic Mail: SMTP, MIME, POP
- Network Management: SNMP

6. Web Protocols:

Chapter 23 (Section 23.2): Review Questions: 23.7 thru 23.9

- Universal Resource Locators (URLs)
- Hypertext Transfer Protocol (HTTP)
- Hypertext Markup Language (HTML)
- XML, XSL, XHTML
- Common Gateway Interface (CGI)
- Active Web Pages: Java Technology & Java Applets

7. Multimedia Protocols

Chapter 24 (Sections 24.2-24.3): Review Questions: 24.2 thru 24.6

- Real-Time Traffic
- Session Initiation Protocol (SIP)
- VoIP (Voice over IP) and other Multimedia Applications

8. The Network Layer

Chapter 10 (Sections 10.5-10.6): HW: 10.8, 10.9, 10.10

- Network Layer Issues
- Virtual Circuit vs. Datagram Service
- Network Access Protocols: X.25

9. Frame Relay Networks

Chapter 10 (Section 10.7): Review Questions: 10.8, 10.9

Chapter 13 (Sections 13.1-13.5): Review Questions: 13.1 thru 13.6; HW: 13.5

- Frame Relay vs. Traditional Packet Switching
- Frame Relay Protocol Architecture
- Frame Relay Data Transfer
- Frame Relay Congestion Control

10. ATM (Asynchronous Transfer Mode) Networks

Chapter 11: Review Questions: All

Chapter 8 (Section 8.2 pp.255-258)

- ATM Protocol Architecture
- ATM Logical Connections
- ATM Cells
- Transmission of ATM Cells
- ATM Service Categories

Exam #2

11. Local Area Networks

Chapter 15: Review Questions: All; HW: 15.3, 15.4, 15.5

Chapter 16 (Sections 16.1-16.2, Appendix A, B):

Review Questions: 16.1 thru 16.7; HW: 16.3

Chapter 7 (Sections 7.1-7.2, Appendix 7A): Review Questions: 7.2 thru 7.11

- LAN Topologies: Bus, Ring, Star
- LAN Transmission Media: Twisted Pair, Coaxial Cable, Fiber Optic Cable
- LAN Protocol Architecture: The IEEE 802 Architecture
- The Logical Link Control (LLC)
- Flow Control and Error Control Mechanisms
- Medium Access Control (MAC) Protocols: CSMA/CD, etc.
- Shared Media vs. Switched LANs
- Layer 2 vs. Layer 3 Switches
- High Speed LANs: Fast Ethernet, Gigabit Ethernet, etc.

12. Wireless Networks

Chapter 9: Review Questions: All

Chapter 17: Review Questions: All

- Wireless Lan Applications
- Wireless LAN Technology
- Spread Spectrum Technology
- IEEE 802.11 Architecture and Services
- IEEE 802.11 MAC Layer
- IEEE 802.11 Physical Layer
- Security Considerations

Final Exam (Cumulative)