CISC 7334: Computer Networks
Text: Data and Computer Communications, 9th 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: 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 2.11; HW Problems: 2.2, 2.5, 2.6, 2.7
   Appendix D: 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 18: Review Questions: All; HW:18.2, 18.3, 18.6, 18.9, 18.10, 18.12, 18.22
   Chapter 21: Review Questions: All, HW 21.2
   Chapter 24 (Section 24.1) Review Question: 24.1; HW: 24.1
   Chapter 15 (section 15.3): Review Question: 15.8
   - 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
4. Transport Protocols
   Chapter 22: Review Questions: All; HW: 22.3, 22.5, 22.6, 22.7, 22.10, 22.13, 22.15, 22.16, 22.17, 22.18
   Chapter 7 (Reference Text - Section 7.3):
   Chapter 26 (Section 26.3): Review Questions: 26.6, 26.7; HW: 26.3, 26.4
   - 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 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)

Midterm Examination

6. Multimedia Protocols
   - 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 11: Review Questions: All, HW: 11.7, 11.8, 11.9
   Chapter 8 (Section 8.2 pp.256-259)
   Chapter 13: Review Questions: All
   Appendix I:
   - ATM Protocol Architecture
   - ATM Logical Connections
   - ATM Cells
   - Transmission of ATM Cells
   - ATM Service Categories
   - ATM Traffic Management
9. Wireless LAN Networks
   - 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
    - 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