

CSE 474 Computer Networks

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Course Description: Basic concepts of data transmission. Overview of network layers and network architectures. ISO-OSI reference model. Physical layer and data communication issues. Circuit switching, packet switching. Network topology. Data link layer and its protocols, error-detection and correction. Local area networks, Ethernet, bridges and switches. Network layer issues and protocols, routing algorithms, congestion control, Internet Protocol. Transport layer and internet transport protocols (TCP and UDP). Network applications and programming: the socket interface, DNS, SMTP, FTP, and WWW.

Course Credits: 3 credits (T: 3, P: 0), ECTS: 6

Textbook: J.F. Kurose and K.W. Ross, Computer Networking: A Top Down Approach, 6th edition, Addison Wesley, 2012. (web site: http://ww.aw.com/kurose_ross)

Reference: A.S. Tanenbaum and D.J.Wetherall, Computer Networks, 5th edition, Prentice-Hall, 2010.

Reference: Computer Networking with Internet Protocols and Technologies, William Stallings, ISBN: 0-13-141098-9.

Grading (tentative):

Midterm: 30%

Programming Assignment(s): 15%

Homework & Quizzes: 15%

Final: 40%

Notes: There will be one socket programming assignments. The assignments are to be submitted in lecture on the assigned due date. No late assignments will be accepted. You will be assigned homeworks or Wireshark labs weekly or biweekly. Some of the homeworks will be graded and some of them will be not. However, questions in the quizzes will heavily depend on your homeworks.

Academic Integrity: Any kind of cheating and plagiarism will be severely penalized. Write everything in your own words and sentences (your own English, even if it is broken!).

Course Outline (tentative):

1. Introduction to Computer Networks I: Access networks, Network core, Network edge
2. Introduction to Computer Networks II: Delay, loss, throughput, protocol layers, history of Internet
3. Application Layer I: Principles, web, HTTP, FTP, SMTP
4. Application Layer II: FTP, SMTP, DNS
5. Application Layer III: P2P applications, socket programming
6. Transport Layer I: UDP, Reliable data transfer
7. Transport Layer II: TCP
8. Transport Layer III: Congestion control
9. Network Layer I: Virtual circuit and datagram networks, routers
10. Network Layer II: IP, ICMP, DHCP, NAT
11. Network Layer III: Routing algorithms, multicasting, broadcasting
12. Data Link Layer I: Error detection and correction, MAC protocols, Ethernet
13. Data Link Layer II: ARP, PPP, Link layer switches
14. Wireless and Mobile Networks: CDMA, Wireless LAN, cellular Internet access, Mobile IP