

CS 408 - Computer Networks

Fall 2020, 3 credits

This is a 3-credit introductory computer networks course specializing on data-link and upper layer. Physical layer will not be examined in detail. Applications and protocols will be emphasized.

Prerequisite: CS 204 – Advanced Programming. Although Math 203 is not a formal prerequisite, probability knowledge is partially needed.

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Lect. Schedule: M 9:40-10:30, T 8:40–10:30, <https://sabanciuniv.zoom.us/j/95250589836?pwd=WFhzcVBSMENPRTUxc0ViZCs3MW42Zz09>

Lab Schedule: Section A: W 11:40 – 13:30 Online, zoom link to be provided before the labs

Section B: Th 13:40 – 15:30 Online, zoom link to be provided before the labs

No labs in the first and possibly in the second week. We will make announcements about when they will start.

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

Reference: Computer Networks, 4th or 5th edition, Andrew Tanenbaum,

Reference: Computer Networks and Internets, Douglas Comer, 5th or 6th ed.

Reference: Computer Networking: A top-down approach featuring the Internet, Kurose and Ross, 4th or newer ed.

Reference: Data and Computer Communications, Stallings, 6th or newer edition.

Outline

- Introduction
 - Circuit Switching, Packet Switching, Basic delay concepts
 - The protocol concept, OSI Model, TCP/IP Architecture and the Internet
- Applications
 - traditional apps (telnet, SMTP, FTP)
 - modern apps (HTTP, DNS, Sockets)
- Data Transmission Basics
- Local Area Networks (LANs) and Ethernet
 - Architecture, Topologies and Technologies
- Data Link Control and Protocols
 - Flow control, Error detection and correction
 - Sliding Window Protocols
- Internet Protocol (IP) and Internetworking
- Routing
- Transport Protocols (TCP)
- Congestion Control
- TCP Traffic Control

Labs, Project and Homework Assignments

There will be 3-4 labs (some of them may last several weeks). During these labs you will have hands-on experience and/or practical lectures on "C# language, socket programming", "Internet protocols (via packet capturing and analysis)", "DNS and various server installations and configurations (subject to online availability)", "LAN design and implementation / IP subnetting". More information on lab sessions will be posted on the lab web site in time.

The labs **WILL NOT** be direct application of the lectures, but they will be related to each other. We **DO NOT** aim to use labs as recitations to help the students to get higher marks in the exams.

There will be tophat/quizzes at unannounced times (15% of the total grade). There will be bonus of 25% for tophat/quizzes but total will not exceed max. possible for that part. This bonus is basically to cover missing ones due to any excuses. Thus there will not be any make-up.

There are one or two homework assignments about lecture material. Moreover, there will be either homework, quiz, project or in-lab performance to be graded related to each lab. Moreover, there will be a term project and its weight will be greater than or equal to 16%. Homework assignments are to be done individually, but the project will be done in groups of 4-5 people (not less than that except really exceptional cases). Project requires programming and it is about development of network applications (this may also require an application layer protocol design). The project will be done in 2 or 3 phases with different deadlines and grading.

Make-up Policy: No make-up! If you miss something, you miss it whatever the reason is! If the reason is really valid, you may take an oral examination instead of a written make-up.

Tentative Grading (subject to change)

Midterm exam 25% (closed everything)

Final exam 30% (closed everything)

Tophat/Quizzes 15%, Homework, project and labs 30%

Important Dates

Midterm Exam: Week 10 – Dec. 8, 2020, Tuesday, 8:40 – 10:30 (lecture hour; online with camera/screen recording).

Final Exam: as scheduled by SR

Homework, project and lab deadlines will be specified separately

Plagiarism will not be tolerated