

CS 408 - Computer Networks

Fall 2021 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: T 13:40-15:30 FMAN 1099, Th 11:40–12:30 FENS G077

<https://sabanciuniv.zoom.us/j/95542927728?pwd=cVhKUEY4Z0lrYTZENys0TkxoSWdPQT09> is the zoom link

In case you need: Meeting ID: 955 4292 7728 Passcode: 753397

Lab Schedule: Section A: M 8:40 – 10:30 FENS L045 Section B: Th 12:40 – 14:30 FENS L045

Exact format of the labs and the zoom links will 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 4 labs planned (one of them will last several weeks; we anticipate using 8 weeks of the labs + some extra lectures during lab hours if needed). 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", "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 one recitation before the midterm exam and one recitation before the final exam, that's it!

I am planning to have tophat/quizzes at unannounced times, probably at every lecture day (10% of the total grade). Tophats will be graded as 50% correctness and 50% attendance. 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 for tophats. We will discuss about tophats during the first lecture.

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.

Exam Details and Make-up Policy

There will be one midterm and one final exam. In line with the order of the university administration, **all exams will be performed face-to-face**.

No make-up exam will be performed for the midterm exam! If you miss it with a valid reason, I can arrange compensation that might include the options of oral exam, using final exam instead, some extra questions in the final, or any combination of it. If you miss the finals exam with a valid reason that I accept as well, compensation mechanism will be determined later.

Hybrid System for the Lectures

Hybrid means I will lecture in the auditorium with camera and microphone and the lecture will be streamed through zoom. You may prefer to attend physically or online. Since the auditoriums' reduced capacities are sufficient to cover the entire class, we will not apply rotation. Please wear your masks all the time in class and respect the physical distance. The seats that you are not allowed to seat are clearly marked with a cross.

Lecture videos will be shared through SUCourse+. This year there will not be a Google shared drive for the videos; all sharing will be through SUCourse+.

Hybrid lectures are different than the online ones that you attended during remote education. The main difference is that my focus during the lecture cannot be the camera; I have to address to people in class. Moreover, the camera is not going to be the laptop camera that used to show my face, but the auditorium's camera that shows me from a distance. Thus the online participants may experience some concentration issues during lectures and I strongly encourage physical participation, although I do not enforce it.

My only reservation is that I really do not want to see the case where few people in class and the majority are online. If this happens sometime during the semester, I can change the rules mentioned above.

Use of SUCourse+ and Communications

I will make announcements via SUCourse+ that you will also receive as emails. Some announcements may be sent as plain email.

We have a Whatsapp group for the class that I also participate (of course you might have another one without me). The invite link for it is <https://chat.whatsapp.com/KGqWO3Wm1z9A84tP44GE15>

All lecture materials, homework and assignments will be posted at SUCourse+. The submissions will also be there unless otherwise stated.

Lecture materials will be posted as powerpoint file without annotations made in class. Each powerpoint file will be shared after it is entirely covered in class.

Tentative Grading (subject to change)

Midterm exam 27% (closed everything)

Final exam 33% (closed everything)

Tophat/Quizzes 10%,

Homework, project and labs 30% (individual weights will be determined later)

Important Dates

Midterm Exam: November 30, 2021, Tuesday, 13:40 – 15:30 (Week 10, Lecture time).

Final Exam: as scheduled by SR

Homework, project and lab deadlines will be specified separately

As mentioned above, all exams will be physical and face to face.

Plagiarism will not be tolerated