

CS 408 - Computer Networks

Fall 2022 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 12:40-14:30 UC G030 (Cinema Hall), Th 10:40–11:30 UC G030 (Cinema Hall)

Lab Schedule: Section A: M 16:40 – 18:30 FENS L045 Section B: W 17:40 – 19:30 FENS L045

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

Lectures and labs will be **physical**. No zoom streaming and no recording.

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 all!

I will take attendance, but I am not planning to use it or having quizzes for credit. However, I keep my rights to use the attendance for credit or start quizzes after an announcement within the semester.

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 around 18%. 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 (picked my me) 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.

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/DFZQ12wu0Qg9pAANy36sk0>

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. Each powerpoint file will be shared after it is entirely covered in class since I can change it even in the last minute.

Tentative Grading (subject to change)

Midterm exam 30% (closed everything)

Final exam 35% (closed everything)

Homework, project and labs 35% (individual weights will be determined later)

Important Dates

Midterm Exam: Dec. 5, 2022, Monday, 12:40 – 14:30 (Week 10, Lecture hour).

Final Exam: as scheduled by SR

Homework, project and lab deadlines will be specified separately

Plagiarism will not be tolerated