

# CS 408 - Computer Networks

Fall 2024 - 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.

**Instructor:** Albert Levi, FENS 1091, x9563, [levi@sabanciuniv.edu](mailto:levi@sabanciuniv.edu)

**TAs:** Alize Sevgi Yalçinkaya, Office Hour: TBD, [alizesevgi@sabanciuniv.edu](mailto:alizesevgi@sabanciuniv.edu)

Alaa Almouradi, Office Hour: TBD, [alaaalmouradi@sabanciuniv.edu](mailto:alaaalmouradi@sabanciuniv.edu)

Saleh Alshurafa, Office Hour: TBD, [saleh@sabanciuniv.edu](mailto:saleh@sabanciuniv.edu)

Recep Yıldırım, Office Hour: TBD, [recep.yildirim@sabanciuniv.edu](mailto:recep.yildirim@sabanciuniv.edu)

**Lect. Schedule:** M 12:40-14:30 FASS G062, T 14:40–15:30 FASS G062

**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 second week. We will make announcements about when they will start.

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

We will be using two textbooks interchangeably. However, you may not need them to buy. Please allow some time to see if you need them. The first textbook is out of print; you may borrow from me or IC to make copies.

**Main Text:** Computer Networking with Internet Protocols and Technologies, William Stallings, (out of print)

**Alternative Text:** Computer Networking: A top-down approach featuring the Internet, Kurose and Ross, 6<sup>h</sup> / newer ed.

**Reference:** Computer Networks, 4th or newer edition, Andrew Tanenbaum,

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

**Reference:** Data and Computer Communications, Stallings, 6<sup>th</sup> 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)
- Data Transmission Basics
- Local Area Networks (LANs) and Ethernet
- 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)", "network configuration in virtual environments (Cisco Labs)", "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 15% (+/- 3%). Homework assignments are to be done individually, but the project will be done in

groups of 2 people. 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 single stage but there will be a second-chance demo with 50% penalty for the deducted points.

### **Exam Details and Make-up Policy**

There will be one midterm and one final exam.

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 by me) of oral exam, using final exam instead, some extra questions in the final, or any combination of them. If you miss the final exam with a valid reason that I accept as well, compensation mechanism will be determined later. Please do not ask questions about the makeup exam details and timing; when I determine them, I will let you know.

### **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/IHNbBeBSpdq1hmf3ihXlsX>

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:** To be determined later (probably around 10<sup>th</sup> week).

**Final Exam:** as scheduled by SR

Homework, project and lab deadlines will be specified separately

## **Plagiarism will not be tolerated**

**Use of Gen AI tools will also be considered as plagiarism for any grading item**

**The sanction for plagiarism in project, assignments and lab work is -100**

**For the exams, any type of cheating (including having an electronic device other than calculator in proximity) will be reported to the Dean's Office for disciplinary actions**