

# CS 408 - Computer Networks Fall 2022

## 3 credits

### **Description and objectives:**

This is a 3-credit introductory computer networks course specializing on data-link and upper layers. 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:**

**Artrim Kjamilji,**

E-mail: [artrimk@sabanciuniv.edu](mailto:artrimk@sabanciuniv.edu)

Zoom link for lectures and instructor's office hours (OH):

<https://sabanciuniv.zoom.us/j/3888722271>

Meeting ID: 388 872 2271

OH: TBD

### **TAs:**

**1. Begüm Arslanhan,**

E-mail: [arslanhanbegum@sabanciuniv.edu](mailto:arslanhanbegum@sabanciuniv.edu)

Zoom link for recitations and office hours:

<https://sabanciuniv.zoom.us/j/6119892969?pwd=YVBMV2tkbXRhUEpLMFY1MmNiaEhBUT09>

OH: TBD

**2. Müge Kuşkon,**

E-mail: [mugekuskon@sabanciuniv.edu](mailto:mugekuskon@sabanciuniv.edu)

Zoom link for lectures and office hours:

<https://sabanciuniv.zoom.us/j/2457215757?pwd=ZEI1TjdUd1JUyTJRQmx1KzNYVnlvZz09>

OH: TBD

**3. Sama Habibi,**

E-mail: [samahabibi@sabanciuniv.edu](mailto:samahabibi@sabanciuniv.edu)

Zoom link for recitations and office hours:

<https://sabanciuniv.zoom.us/j/6395029220>

OH: TBD

### **Lecture's info:**

Zoom Link: <https://sabanciuniv.zoom.us/j/3888722271> , Meeting ID: 388 872 2271

Schedule: Tuesday, 11.40-12.30, University center G030, (online and physical presence)

Tuesday, 14.40-16.30, FASS G062, (online and physical presence)

### **Lab Schedule:** Thursday 17:40 – 19:30 FENS G077

Exact format of the labs and the zoom links will be provided before the labs. No labs in the first two weeks  
We will make announcements about them when they will start.

**Main reference:** Computer Networking: A top-down approach, Kurose and Ross, 7<sup>th</sup> and 8<sup>th</sup> edition.

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

**Reference:** Computer Networks, 5<sup>th</sup> or newer edition, Andrew Tanenbaum,

**Reference:** Reference: Data and Computer Communications, Stallings, 6<sup>th</sup> or newer edition.

## Topics planned to be covered:

- **Introduction:** what is the internet, network edge (end systems, access networks, links), network core (packet switching, circuit switching, network structure), delay, loss, throughput in networks protocol layers (services and models), networks under attack: security, history
- **Application layer:** principles of network applications, Web and HTTP, electronic mail (SMTP, POP3, IMAP), DNS, P2P applications, video streaming and content distribution networks, socket programming with TCP and UDP
- **Transport layer:** transport-layer services, multiplexing and demultiplexing, connectionless transport: UDP, principles of reliable data transfer, connection-oriented transport: TCP (segment structure, reliable data transfer, flow control), connection management, principles of congestion control, TCP congestion control
- **Network Layer – the data plane:** overview of Network layer (data plane, control plane), What's inside a router, IP: Internet Protocol (datagram format, fragmentation, IPv4 addressing, network address translation – NAT, IPv6), Generalized Forward and SDN (match, action, OpenFlow examples of match-plus-action in action)
- **Network Layer – the data plane:** routing protocols (link state, distance vector), intra-AS routing in the Internet: OSPF, routing among the ISPs: BGP, The SDN control plane, ICMP: The Internet Control Message Protocol, Network management and SNMP
- **The data link layer and LANs:** introduction, services, error detection and correction, multiple access protocols, LANs, addressing, ARP, Ethernet, switches, VLANS
- **Physical layer, security, mobile networks**

## Labs, Project and Homework Assignments:

1. 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 announced in time through SUCourse. 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.

2. There will be 3 to 5 assignments of different difficulty and grade weight. Assignments are submitted to SUCourse.

3. There will be a term project conducted in 2 or 3 phases (stages). The term project will be done in groups of 3-4 people. The participants of the same group should submit the same assignment solution to SUCourse.

## Grading criterias:

**One midterm exam (20%):** most probably during the lectures. The date will be announced in advance

**Final exam (30%):** will be scheduled by student resources

The exams (both the Midterm and the Final) are planned to be done physically (at the campus) by taking all the necessary precautions. More details about the exams will be provided as the details become clear.

**Homework assignments (20-25%):** 3-5 assignments. Done individually. Of different weight in terms of grade percentage. They will be about solving exercises related to networking, capturing packets by Wireshark or socket programming.

**Term project (20-25%):** – done in 2 or 3 phases. While the term project will be done in groups of 3-4 people, if someone does all of the phases alone, he/she will get an extra 3% towards the final grade.

**Attendance and/or quizzes and/or lab activities (5-10%).** The attendance taking and/or quizzes will be done un-announced.

In case of suspicion, for all of the above criteria we might schedule a face-to-face Zoom meeting or at-campus examination.

### **Homework and term project submission and Grading Policy of CS 408:**

- All homework submissions must be done **until the specified deadline**. If you submit on the exact deadline time, then you are late. That means if the deadline is 21:00, then the latest second that you can submit is 20:59:59.
- Late homework submission is allowed, but only for one day (24 hours). Late submission penalty is 10%.
- Homework submission must be done only to SUCourse+. Email or other type of submissions are not allowed.
- You will be able to resubmit your homework until the deadline.
- If you resubmit your homework after the deadline, but during the late submission period, your homework will be treated as late.
- **No modification is allowed after SUCourse+ closes**. Thus, please make sure that you've submitted the correct homework. If you submit wrong file or if a crucial file is missing, we cannot grade your homework and you get zero (0). We do not allow code changes after SUCourse+ closes either. We grade whatever you submit to SUCourse+. Sometimes, the students argue the local computer's system time as a proof of timely completion of a wrongly submitted homework; we cannot accept such local proofs and we cannot accept any file other the ones submitted to SUCourse+. No exceptions to this rule.
- Homework and term project grading may be done via a demo and you may be questioned about your homework during the demo.
- You will have at least 7 days to do your homework or each term project phase.

### **Rules and regulation regarding the instructor's and TAs' office hours:**

1. Office hours will be done by Zoom. The zoom links are the same as the lectures and recitation links.
2. In case of multiple students showing up for the same OH, as soon as they join the meeting they should write their names in the chat section of the Zoom. The students will be served in first-come first-served order according to their names written in the chat section of Zoom. When the turn of a particular student comes, the instructor/TA shares a private/separate meeting with that student either by using a breakout zoom section or by sharing a google meet link with him. We do so since during the OH students might need to share their screen and ask question related to their HW codes and the other students are not supposed to see them
3. In case of multiple students showing during the same OH, besides first-come first served, they will be served in round-robin fashion so that no more than 6-7 minutes (on average it is one question) is spend on a single student. We do this for fairness reasons so that all of the students can get a relatively equal time to get their questions answers. After using his/hers time quota of 6-7 minutes, if the student has more questions, he/she can write his/her name again in the chat section Zoom and wait for his/her turn again.

### **Rules to submit a medical report to take a make-up exam in CS 408**

1. All medical reports must be submitted BEFORE the exam. If this is not possible due to last minute problems or you cannot go to a medical institution due to COVID-19, the instructor must be called before the exam. Any excuses that will be taken into instructor's account after the exam will not be considered.
2. Please keep in mind that it is totally up to the instructor to accept a medical report/excuse according to the by-laws. That means, a medical report does not guarantee taking a make-up exam. The instructor must make sure about the necessity of taking the make-up exam depending on your illness.
3. Moreover, please keep in mind that for fairness reasons towards other students, the advantage of having a late exam will be compensated by having **more difficult questions in the makeup exam**. Make-up exams can be totally or partially verbal (sözlü in Turkish).

### **Other Rules and Remarks**

1. Weighted average is not the only criterion in letter grading; exam average may also be taken into consideration. Discrepancies between homework and exam averages will also be considered in letter grading and unexplainable discrepancies may reduce the homework contribution to overall grade.
2. Students are expected to attend all classes, recitations and labs. Absenteeism does not buy time.
3. Students are responsible for the material covered in class even if it is not part of the lecture notes published on the website (Sometimes we explain some stuff on the board). That is why attendance is important.
4. I will be sharing lecture videos in case you miss a point during lectures or if you miss a lecture due to reasonable excuses We might also share the recitation videos. If we decide to share them, each week only one of the sections will be shared. 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. For most of the weeks I plan to post
5. Students are responsible to check their emails (Sabanci University accounts), SUCourse+ and course website daily for any announcements related to this course.
6. Honest and friendly advice: Do not leave materials to be accumulated, don't delay your tasks (HW, studying for exams, etc.) for the last minute. Don't think that the last office hours of the last day before the submission deadline will help you. Usually those office hours are overcrowded. **So do all of your tasks consistently (continuously) and in timely fashion.**

### **A brief Summary on Policy on Plagiarism and Homework Trading**

A plagiarized homework may or may not be a verbatim copy of another homework. Verbatim copies are of course plagiarized ones. However, if a homework is derived from another one by partially changing some parts, this action is also plagiarism. Cooperation and working together is not an excuse (except for the students of the same group in term project). There are software products available to catch such cases, and we use them. When a plagiarism case is detected, sanctions are applied to all parties regardless of the actual source of the homework. These sanctions are as follows.

1. All plagiarized homework owners receive –100 (minus hundred).
2. Second time, the student fails the course automatically.

**AGAIN! We have zero tolerance towards Plagiarism, HW Trading, Illegal Local and Remote Help and Cheating during the exams They will be penalized according to the corresponding regulations.**