

CS 403/534 - Distributed Systems

Fall 2021

This is a 3-credit course that focuses on the fundamentals of distributed systems. It mainly concentrates on the layer of software that needs to be built on top of computer networks to enable the development of distributed applications.

Catalogue Data: This course focuses on the design, implementation and management of distributed systems. Topics include communication, processes, naming, synchronization, consistency and replication, fault tolerance, security, resource sharing, and remote procedure call and remote method invocation; distributed object-based systems, distributed file systems, and distributed document-based systems; handling transactions and coordination of multiple machines, peer-to-peer systems.

Prerequisite: The class is open to any graduate and undergraduate students, who have previously taken CS 307 – Operation Systems (or an equivalent course) and scored minimum grade of D (or who have convinced and got the consent of the instructor).

Instructor: Süha Orhun Mutluergil
FENS 1098, x9606, suha.mutluergil@sabanciuniv.edu
Zoom Link (for courses and office hours): <https://sabanciuniv.zoom.us/j/9894421535>
Office Hours: Thursdays 12.40 – 14.30, [Zoom](#) (online)

TA: Ayşegül Rana Erdemli
aysegulrana@sabanciuniv.edu
Office Hours: Monday 10.40 – 12.30, Meet (online)
Zoom Link (office hours): <https://meet.google.com/vna-fwvd-ihe>

Schedule: Lecture: Tuesday 15:40 – 16:30, FENS G032
Lecture: Wednesday 08:40 – 10:30, FENS G032
Lab: Wednesday 17:40 – 19:30 FENS L045

Textbooks

- Andrew S. Tanenbaum and Maarten van Steen. [Distributed Systems: Principles and Paradigms](#), Edition 3.01, Published by Maarten van Steen, 2017, ISBN: 978-15-430573-8-6 (printed version) and 978-90-815406-2-9 (online version) (not required to buy one, obtaining a personal online copy is possible: [link](#)).
- Martin Kleppmann. Distributed Systems Lecture Notes. University of Cambridge. Free under [CC BY-SA](#) and available online: [link](#).
- Remzi H. Arpaci-Dusseau and Andrea C. Arpaci-Dusseau. Operating Systems: Three Easy Pieces, 1.00 Edition, Published by CreateSpace Independent Publishing Platform, 2018, ISBN: 978-1985086593. Free pdf available online: [link](#). We will go through chapters 47-51.

Tentative Outline

- Introduction
- Concurrency
- Processes
- Communication
- Coordination
- Consistency and Replication
- Fault Tolerance
- Advanced Topics

Student Responsibilities (tentative)

- **Programming Assignments:** There will be 4 assignments. You will be required to write computer programs in **Python** programming language, write reports, solve problems, or prove theorems.
- **Class projects:** In addition to homework assignments, students are required to work on a project. Students may propose a project topic subject to the instructor's approval. Otherwise, students will work on the project offered

by the instructor. It can be a project that involves implementation of a complicated algorithm seen in the class or it can be research project that involves understanding and presenting a recent paper in the field.

- **Quizzes:** Each week (after the add-drop period) there will be in class quizzes on **Wednesdays**. The quiz content might come from the topic explained at the same day or from the previous week. Highest 10 out of 12 quizzes will be counted for grading.

Grading

Midterm Exam	25%
Final Exam	35%
Programming Assignments	20%
Project	10%
Quiz	10%

Note: The instructor holds the right to decide a policy concerning issues not already covered here.

Office Hour Policy: This semester office hours will be done online due to the pandemic. To attend the office hours of both the TA and the instructor (course staff), students must email to the corresponding course staff few hours ago. **Last minute appointment requests will not be accepted.** Each member of the course staff will reserve 2 hours per week for conducting office hours. Office hours are divided into 30-minute slots. Students can request at most one slot per week. Slots will be booked in a first come first served manner. After all the slots become full, course staff **does not guarantee** to open new slots.

Email Policy: Course staff (the TA and the instructor) are expected to return student emails within 48 hours. Course staff might not always provide immediate responses. It is advised that students do not wait until the submission deadline for doing their assignments. Course staff try to be more responsive during the deadline period but last-minute questions might not be answered due to the heavy email traffic. Students are advised to post their course related questions to the discussion forum in SUCourse since other students might answer them quickly. Course staff has the freedom of not answering a student question if the answer already exists in the course material (syllabus, discussion forums, course book or any other material in SUCourse) or if the student is expected to find the answer herself/himself.

Grace Day Policy: Each student has **5 grace days** in total that can be used throughout the semester for extending missed deadlines. It can only be used for extending **programming assignment project** deadlines. The student might use all grace days at once for one assignment or partition it among distinct assignments. Granularity of using grace days is 1-day. For instance, the student cannot ask for a 10-hour extension and save 4 days 14 hours for later. The student does not have to present any excuse or document for using his/her grace days. However, s/he must request an extension before the deadline passes. Requests must be made to the TA **Ayşegül Rana Erdemli** (aysegulrana@sabanciuniv.edu). If the student finishes all of his/her grace days, no further extension will be given to him/her even if he/she has a valid excuse and documentation.

Make-up Policy: There is only **one** make-up exam that is conducted after the final exam. The exam date is decided and announced after the final. Only students with a valid excuse (SU health-center approved health report or any other official document) for the midterm or the final exam are eligible for the make-up. The make-up grade can replace only one exam. Even though the student has a valid excuse for not attending both final and midterm exams, they can take the make-up for replacing only one of them.

Academic Integrity / Plagiarism: Cheating and plagiarism will not be tolerated, see [Sabanci University's statement on academic integrity](#) for more information.