CS 307 - Operating Systems

Fall 2023

This is a 3-credit course that aims to get students familiar with the operating systems concepts and design principles. Students will have some experience through theoretical lectures and practical projects.

Catalogue Data: This course covers fundamental aspects of operating systems: management of resources such as CPU, memory space and peripheral devices. Topics include concurrent processes, mutual exclusion, process communication, cooperation, deadlocks, semaphores, scheduling and protection. The course will also highlight important aspects of operating systems such as UNIX, Windows, etc.

Prerequisite: The class is open to any graduate and undergraduate students, who have previously taken CS 204 –Advanced Programming (or an equivalent course) and scored minimum grade of D.

Instructor: Süha Orhun Mutluergil
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Office Hours: 15.40 – 17.30, Thursday (on Zoom, by appointment)

TAs: Baran Deniz Karahan
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Office Hours: 15.40 – 17.30, Wednesday (on Zoom, by appointment)

Burak İzer
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Office Hours: 17.40 – 19.30, Monday (on Zoom, by appointment)

LAs: Tacettin Emre Bök
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Office Hours: 10.40 – 12.30, Friday (on Zoom, by appointment)

Oktay Çelik
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Yasin Albayrak
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Office Hours: 18.40 – 20.30, Tuesday (on Zoom, by appointment)

Schedule: Lecture: 10:40 – 11:30, Wednesdays (at FENS G077, physical)
Lecture: 8:40 – 10:30, Thursdays (at FENS G077, physical)
Recitation: 18:40 – 19:30, Thursdays (at SBS 1099, physical)

Textbook: (Primary Online Source) 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 online access: https://pages.cs.wisc.edu/~remzi/OSTEP/

Tentative Outline

- Introduction to Computer Systems
- Processes and Program Virtualization
- Scheduling
- Memory Virtualization
- Paging and Swapping
- Concurrency
- Synchronization Mechanisms
- I/O Management
- Persistent Storage

Student Responsibilities

- **Programming Assignments:** There will be 4 programming assignments. You will be required to write C/C++ programs. Your programs should compile and run properly on UNIX-based operating systems. Weights of programming assignments might be different.
- **Midterm Exam:** 2 hours exam towards the end of 8th week. Midterm exam will be physical and in class. Students will answer both theoretical and computational questions using pen and paper.
- **Final Exam:** 2-3 hours exam that will be held during the finals week. It will be scheduled and announced by SR. The final exam will cover all the topics in the course.
- **Oral Exams:** For each of the items above, some students might be randomly called for an oral examination to clarify their work. For these students, the score for this item will be calculated as the average of their original and oral exam scores.

Grading (tentative)

Programming Assignments	%30
Midterm Exam	%30
Final Exam	%40

IMPORTANT NOTE: Students whose total grade is less than 35 or final exam grade (or the make-up exam grade that will replace the final exam) is less than 25 will automatically fail the course (get an F).
IMPORTANT NOTE 2: If the average score of programming assignments is more than 2 times the average of the midterm and final exam scores, then it will be replaced by 2 times the final exam score.
Example Scenario: Assume that your final exam score is 30, midterm score is 50 and PA average is 100. Then, your quiz average will be replaced by 2*(30+50)/2 = 80.

Office Hour Policy: This semester office hours will be online. To attend the office hours of LAs, TAs 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 are expected to reply to 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 2 day 10-hour extension and save 2 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 addressed to **TBA**. 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 to replace 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.
Students' programming assignment submissions will be compared with other submissions from both the current and previous terms by the course staff using JPLAG tool. If the similarity score exceeds a predetermined threshold, penalties will be applied. If the JPLAG test fails for the first time, student's score might be reduced to 0 depending on the degree of similarity. For the second JPLAG failure, the obtained score will be -100 for both submissions and for the third failure the student's case will be directly forwarded to the disciplinary committee for further investigation. It will **not** be possible to regain scores of failed tests back through extra assignments, resubmissions, and oral exams.
Note: The instructor holds the right to decide a policy concerning issues not already covered here.