

Tentative Syllabus for an Online Course
CENG532 Distributed Computing Systems
2021-2022 Fall

Instructor: Ertan Onur, eronur@metu.edu.tr, 5534, B211

Office Hours: Mondays 14:30-15:30, e-mail me for an online appointment

Logistics for Section 1 (MS w/ thesis, TE for undergrad): Mondays, 09:40-12:30

Zoom Link: <https://zoom.us/j/99810312962?pwd=N2RWZ00vQmFxaEhyOXBvWkVEaTBXQT09>

Logistics for Section 2 (MS w/o thesis): Mondays, 18:00-21:00

Zoom Link: <https://zoom.us/j/99747512651?pwd=Q1ZuYU9tcmR1SUUvUDMwdzR3UDFBdz09>

Catalog Description: Basics of distributed computing systems. Global state management in distributed computing systems. Communication in distributed systems. Inter Process Communication and remote procedure call. Distributed file systems. Fault tolerance. Synchronization and deadlocks. Load balancing and process migration. Distributed Operating Systems issues. Project(s).

Course Objectives: By the end of the course, you will be able to
demonstrate knowledge of the basic elements and concepts related to distributed systems,
demonstrate knowledge of the core architectural aspects of distributed systems,
understand the fundamental issues in distributed computing sufficient to form a sound basis for the design and implementation of a distributed system,
design and **implement** distributed applications,
demonstrate knowledge of the main underlying components of distributed systems,
describe the problems and pitfalls relating to the operation of distributed systems,
use and apply important methods in distributed systems to support scalability and fault tolerance.

Communication: Moodle at <https://odtuclass.metu.edu.tr>

✓ **Textbook (TB):** Distributed Systems by Maarten van Steen and Andrew S. Tanenbaum, CreateSpace Independent Publishing Platform; 3.01 edition (February 1, 2017) (You can download the textbook at <https://www.distributed-systems.net>)

Reference Books:

Fokkink, Wan. Distributed algorithms: an intuitive approach. MIT Press, 2018.

S. Ghosh. *Distributed Systems: An Algorithmic Approach*, 2nd ed. Chapman & Hall, 2014

A.D. Kshemkalyani, M. Singhal. *Distributed Computing: Principles, Algorithm, and Systems*. Cambridge University Press, 2008

Prerequisites: CENG435 Data Communications and Networking, CENG334 Operating Systems or equivalents. Undergrads can take the course if they have already taken both of these courses and scored AA in CENG435. Programming experience in python is compulsory.

Grading:

Topic presentation	10%
Term project on the selected topic	30%
Midterm (possibly an oral exam)	20%
Final (possibly an oral exam)	40%

NA Grade: Those who do not deliver an acceptable term project or do not give a topic presentation will get an NA grade.

Course Outline: I) Introduction II) Architectures III) Processes IV) Communication V) Naming VI) Coordination VII) Synchronization VIII) Consistency and Replication IX) Fault Tolerance

Late Submission: Work submitted late and without prior communication with the teaching assistant or lecturer will not be accepted. Please communicate with the teaching assistants or the lecturer as soon as you know you cannot meet a deadline if you would like to request an extension on a specific assignment. Extensions will be permitted on a case-by-case basis considering the pandemic.

Attendance Policy: Attendance to lectures and accomplishing activities are compulsory. An online course unlike a face-to-face course attendance is not taken as roll call or a checklist. Instead, attendance is demonstrated by your participation and engagement in activities and completion of the given assignments. It is essential that you are present and engage in the course and discussion forums.

Accommodation Policy: If you have special needs, please inform the instructor ASAP.

Mutual Expectations: Please remember, if you have any questions, concerns, or comments, to let me know right away. I welcome any feedback you are willing to offer. Mutual expectations are the following: **1)** Please be active and participate in class, ask questions, raise concern and make remarks, **2)** Listen and respect others, **3)** Be comfortable taking risks, **4)** Complete all assignments, **5)** Turn off your cell phones and communication devices during the lectures, **6)** Be punctual for all classes, **7)** Discuss class concerns either after class or during designated office hours, **8)** Be prepared for class by reading chapter and watching the lecture recording prior to lesson.

About Online Videos: It is **strictly** forbidden to distribute the videos and other resources uploaded on ODTUCLASS. Our class sessions may be audio-visually recorded. Students who participate with their camera engaged or who utilize a profile image are agreeing to have their audio/video or image recorded. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. The recordings will be available on Odtuclass throughout the semester. The recordings will be deleted permanently, after the final grades are announced officially. By taking this course, you agree that the class sessions and exams that may contain your avatar, picture, video and/or voice will be recorded and shared on Odtuclass for those students and instructors taking part in this specific course.

Course Conduct: For carrying out your term projects, you will contribute to the open source AHC project (<https://github.com/cengwins/ahc>) in Python. You will have to sign a code of conduct and an online consent form on Odtuclass. If you do not wish to contribute to the open source project or give consent to the online content, please drop the course. We will use the flipped classroom technique: you will watch the lecture recordings on Youtube and we will discuss your/my questions in the scheduled lecture hours. Weekly schedules will be posted on Odtuclass.

Academic Honesty: There will be no tolerance to cheating in the exam and to plagiarism (copying someone else's work as if it is yours). The student who cheats will fail the course and be punished according to METU regulations.

METU Code of Honour: As reliable, responsible and honorable individuals, all members of Middle East Technical University embrace only the success and recognition they deserve, and act with integrity in the use, evaluation and presentation of facts, data and documents.

Reminders: **1)** Carefully read the documents concerning academic integrity which have been issued to you and the related regulations on the University's website. **2)** Learn in detail which situations fall into the scope of plagiarism in academic studies from relevant resources (e.g. ODTU UEAM website). In cases of plagiarism, excuses such as "I wasn't aware that what I've done is within the scope of plagiarism" are unacceptable. Be informed that the responsibility for such behavior is entirely yours. **3)** Use your own ideas in all of your work such a piece of homework, project etc. Indicate the source of any thought, idea, text, document or finding which does not belong to you. **4)** Prepare all your homework, projects, reports etc. by referring to the accessible original (primary) sources. **5)** During examinations, abide by the rules in the Middle East Technical University Guide for Rules To Be Followed in an Examination Environment as well as the rules determined by the instructor of the course.