

Tentative Syllabus
CENG532 Distributed Computing Systems
2018-2019 Fall

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

Office Hours: Fridays 09:30-10:30 and by appointment.

Logistics Tuesdays, BMB5, 13:40-16:30.

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 details 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>)

Supplemental Books:

C. Cachin, R. Guerraoui and L. Rodrigues, *Introduction to Reliable and Secure Distributed Programming*, Springer, 2011.

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

H. Attiya, J. Welch, *Distributed Computing: Fundamentals, Simulations and Advanced Topics*, 2nd ed. Wiley, 2004.

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 C or python is compulsory.

Grading:

Topic Presentation	10%
Term Project	30%
Midterm	25%
Final	35%

NA Grade: Those who do not attend the midterm or deliver an acceptable term project will get an NA grade.

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.

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