

Tentative Syllabus
CENG532 Distributed Computing Systems
2017-2018 Spring

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

Office Hours: Mondays 11:00-12:00 and by appointment.

Logistics Tuesdays, G102, 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:

- 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:

Term paper	20%
Presentations	20%
3 Assignments	30%
Final	30%

NA Grade: Those who do not deliver an acceptable term paper or a presentation or at least one assignments 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. We will discuss vulnerabilities in networked systems. You should not exploit those vulnerabilities; please behave responsibly.

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