

Course Name	Course Code	semester	T + P	Credit	ECTS
Distributed Systems			3+0	3	6

Prerequisite Courses	None
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Language of Course	Turkish
Course class	Technical Elective
Coordinator of Course	
Instructor	
Course Assistant	
Objective of Course	The aim of this course is to introduce the concepts and practices of distributed structures based on distributed algorithms and distributed operating systems; to provide the concept of scope and constraints of distributed system applications and to enable them to analyze and comment on distributed systems.
Course Learning Output	Students who have successfully completed this course: <ul style="list-style-type: none"> • Can understand the application areas of distributed systems and distributed systems. • Can understand algorithms running in distributed systems. • Design distributed algorithms considering the constraints of distributed systems for a given problem. • Mutual exclusion in distributed systems can understand the problems and solutions of leading selection.
Course Contents	Definition of distributed systems. Synchronization of thread and thread, Synchronization in distributed systems, time management: logical clocks, vector clocks, global state of distributed system, end detection, distributed mutual exclusion: central algorithms, Lamport's distributed algorithm, heuristic algorithms, distributed algorithms, distributed algorithms, negotiation protocols: Byzantine Agreement, dynamic scheduling in distributed systems, distributed scheduling in distributed systems, distributed file systems, fault tolerance in distributed systems, distributed real time systems.

Weeks	Topics
1	Definition of distributed systems, purposes of distributed systems
2	Communication, inter-task communication, layered protocols, server client architecture
3	Remote procedure call, server and client stubs, RPC instance: DCE, persistence and transience concepts in message passing.
4	Message-based interfacing software (MOM), classification of distributed communications, introduction of MPI
5	Tasks, threads, scope switching costs, threads in centralized systems, threads in distributed systems
6	Multithreaded server-client architectures, code migration, code migration examples, software agents in distributed systems.
7	RMI definition in Java and sample RMI applications.
8	MIDTERM
9	Naming in distributed systems
10	Synchronization in distributed systems

11	Mutual exclusion in distributed systems,
12	Agreement protocols: Byzantine agreement, Lamport - Shostak - Pease algorithm,
13	Global state detection of distributed systems, global state detection algorithms.
14	Distributed file systems,
15	FINAL EXAM

General Sufficiency
It is taken into consideration that students can understand the distributed systems and the main topics.
References
<ul style="list-style-type: none"> • Advanced Concepts in Operating System, Mukesh Singhal and Niranjana Shivaratri, McGraw-Hill, 1994. Distributed Systems: Principles and Paradigms, 2/E, Andrew S. Tanenbaum, Maarten van Steen, Prentice-Hall, 2008. • Distributed Computing: Principles, Algorithms, and Systems, Ajay D. Kshemkalyani, Chicago Mukesh Singhal, Cambridge Press, 2008, ISBN-13: 9780521876346
Assessment
Midterm exam: 40%, Final exam: 60%; Project or homework evaluations can be made at the beginning of the semester.