

Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
INF443	Distributed Systems and Applications	7	4	0	0	4	6

Prerequisites	INF103 VE INF223
Admission Requirements	INF103 VE INF223

Language of Instruction	
Course Type	Compulsory
Course Level	Bachelor Degree
Objective	The aim of this course is to provide an understanding of the basic design principles of distributed systems. While achieving this aim, it is aimed to give both theoretical and practical approaches in a balanced way. Accordingly, in the context of computer networks, new methods are shown in which the communication methods that students have seen before will be applied in particular applications. It is aimed to reinforce their knowledge through the practice assignments given throughout the course.
Content	1. Definition of Distributed Systems. Define the problem and state the objectives. Example applications and difficulties encountered. 2. Examining hardware and software systems within the framework of the concepts of Transparency, Openness and Scalability. Architectural models. 3. Examination of communication stacks. Multilayer structures. Middleware design. 4. Analysis of RMI, RPC and web services structures. 5. Time Coordination, Physical clock based coordination algorithms, GPS 6. Event sequencing in distributed systems, Lamport's logical clocks 7. Logical Clock algorithms and their applications 8. Client-Server architectures, distribution of computing, horizontal and vertical deployments 9. Architectures for horizontal computational distribution, load distribution 10. Middleware design. 11. P2P systems: Requirements, Architectures, Applications 12. Cloud Computing Systems: Definition, Architectures, Role in Distributed Systems and Integration Strategies 13. Current architectures: Internet of Things (IoT), Computing at the Edge, Cloud Computing, 5G Architecture
References	1. Distributed Systems: Concepts and Design, 4. basım, George Coulouris et al, Addison Wesley, 2006. 2. Distributed Systems - Principles and Paradigms, 1. basım, Andrew S.Tanenbaum & Maarten van Steen, Prentice Hall, 2002.

Theory Topics

Week	Weekly Contents
1	Definition of Distributed Systems. Define the problem and state the objectives. Example applications and difficulties encountered.
2	Examining hardware and software systems within the framework of the concepts of Transparency, Openness and Scalability. Architectural models.
3	Examination of communication stacks. Multilayer structures. Middleware design.
4	Analysis of RMI, RPC and web services structures
5	Time Coordination, Physical clock based coordination algorithms, GPS
6	Event sequencing in distributed systems, Lamport's logical clocks
7	Logical Clock algorithms and their applications
8	Midterm exam
9	Client-Server architectures, distribution of computing, horizontal and vertical deployments
10	Architectures for horizontal computational distribution, load distribution
11	Middleware design
12	P2P systems: Requirements, Architectures, Applications
13	Cloud Computing Systems: Definition, Architectures, Role in Distributed Systems and Integration Strategies
14	Current architectures: Internet of Things (IoT), Computing at the Edge, Cloud Computing, 5G Architecture