

**School of Engineering and Natural Sciences / Computer Engineering (English)**

**2022 - 2023 Academic Year**

**OPERATING SYSTEMS**

**Syllabus**

Course Description					
Name	Code	Semester	T+A Hour	Credit	ECTS
OPERATING SYSTEMS	COE3110758	Fall Semester	3+2	4	8
<b>Prerequisites Courses</b>	BİLGİSAYAR ORGANİZASYONU; VERİ YAPILARI				
<b>Recommended Elective Courses</b>	Computer Organization & Data Structures				
<b>Language of Instruction</b>	English				
<b>Course Level</b>	First Cycle (Bachelor's Degree)				
<b>Course Type</b>	Required				
<b>Course Coordinator</b>	Prof.Dr. Selim AKYOKUŞ				
<b>Name of Lecturer(s)</b>	Prof.Dr. Tansel ÖZYER				
<b>Assistant(s)</b>					
<b>Aim</b>	The objective of this course is to introduce and discuss the concepts, structures and mechanisms of modern operating systems. Topics include an overview of operating system fundamentals, process management, multi-threading, concurrency issues, memory management, virtual memory, scheduling techniques, I/O management, file management, security issues, virtual machines, cloud systems, mobile and embedded operating systems. The course focus will be on operating systems internals rather than the operating systems interface.				
<b>Course Content</b>	This course contains; Introduction and Computer System Overview, Operating Systems overview. OS Services., Process Description and Control, Threads, Concurrency: Mutual Exclusion and Synchronization, Concurrency: Deadlock and Starvation, Memory Management, Virtual Memory, Uniprocessor and Multiprocessor Scheduling, I/O Management, Disk Scheduling and File Management, Operating System Security , Virtual Machines and Cloud Operating Systems, Sanal Makineler ve Bulut İşletim Sistemleri, Mobile, Embedded and IoT Operating Systems.				
<b>Course Learning Outcomes</b>			<b>Teaching Methods</b>	<b>Assessment Methods</b>	
1. Understand the concepts, structures, and mechanisms of modern operating systems 2. Understand concurrency issues, mutual exclusion, synchronization, deadlocks, deadlock prevention, avoidance, and the use of semaphores 3. Understand memory management, virtual memory, swapping, paging algorithms, segmentation. 4. Understand input/output and file management systems. 5. Learn current directions and developments of operating systems on the use of virtual machines, cloud systems, mobile and embedded systems. 6. Learn specific design decisions and functionality of various OS like Unix , Linux, Windows and Android operating systems			1, 12, 15, 2, 4, 9	A, C, D, E	
<b>Teaching Methods</b>	1: Lecture, 12: Case study, 15: Problem solving, 2: Question - Answer, 4: Exercise, Practice, 9: Simulation				
<b>Assessment Methods</b>	A: Written Exam, C: Homework, D: Project / Design, E: Quiz				
<b>Lecture Schedule</b>					
<b>Sequence</b>	<b>Topics</b>	<b>Preliminary Preparation</b>			
1	Introduction and Computer System Overview	Textbook chapter 1			
2	Operating Systems overview. OS Services.	Textbook chapter 2			
3	Process Description and Control	Textbook chapters 3			
4	Threads	Textbook chapter 4			
5	Concurrency: Mutual Exclusion and Synchronization	Textbook chapter 5			
6	Concurrency: Deadlock and Starvation	Textbook chapter 6			
7	Memory Management	Textbook chapters 7			
8	Virtual Memory	Textbook chapter 8			
9	Uniprocessor and Multiprocessor Scheduling	Textbook chapter 9 and 10			
10	I/O Management, Disk Scheduling and File Management	Textbook chapter 11 and 12			
11	Operating System Security	Textbook Chapter 15			
12	Virtual Machines and Cloud Operating Systems	Textbook chapters 14			
13	Sanal Makineler ve Bulut İşletim Sistemleri	Textbook chapter 14			
14	Mobile, Embedded and IoT Operating Systems	Textbook Chapter 13 and 16			
<b>Evaluation Methods</b>		<b>Weight(%)</b>			
Midterm Exam		30			
General Exam		70			

Resources	
- William Stallings, Operating Systems, Internals and Design Principles, 9th Edition, Prentice Hall, 2017.	
- A. Silberschatz, P. B. Galvin and G. Gagne, Operating System Concepts, 10th Edition, John Wiley & Sons, Inc., 2018.- A. Tannenbaum, Modern Operating Systems, 4th Edition, Prentice Hall, 2014.	
- T. Anderson and M. Dahlin, Operating Systems: Principles and Practice, 2nd Edition, Recursive Books Ltd. 2014.	