

OSTIM TECHNICAL UNIVERSITY FACULTY OF ENGINEERING COMPUTER ENGINEERING

COURSE SYLLABUS FORM 2021-2022 FALL

CENG 303 Operating System										
Course Name	Course Code	Term	Hours	App Hours	Lab Hours	Credit	ECTS			
Operating System	CENG 303	5	3	0	0	3	7,5			

Language of Instruction	English	
Course Status	Compulsory	
Type of Instruction	Online	
Instructor/s	Assist. Prof. Dr. Ramazan KOCAOĞLU	

Course Objectives

The goal of this course is to provide an introduction to the internal operation of modern operating systems. In particular, the course will cover processes and threads, mutual exclusion, CPU scheduling, deadlock, memory management, and file systems. If time permits, we may briefly examine networking and distributed computing, and perhaps other topics. Students will use the OpenBSD operating system for several programming projects.

Learning Outcomes

- Overview of operating systems, functionalities and charateristics of OS.
- Hardware concepts related to OS, CPU states, I/O channels, memory hierarchy, microprogramming
- The concept of a process, operations on processes, process states, concurrent processes, process control block, process context.
- UNIX process control and management, PCB, signals, forks and pipes.
- Interrupt processing, operating system organisation, OS kernel FLIH, dispatcher.
- Job and processor scheduling, scheduling algorithms, process hierarchies.
- Problems of concurrent processes, critical sections, mutual exclusion, synchronisation, deadlock.
- Mutual exclusion, process co-operation, producer and consumer processes.
- Semaphores: definition, init, wait, signal operations.
- Use of semaphores to implement mutex, process synchronisation etc., implementation of semaphores.
- Critical regions, Conditional Critical Regions, Monitors, Ada Tasks.
- Interprocess Communication (IPC), Message Passing, Direct and Indirect
- Deadlock: prevention, detection, avoidance, banker's algorithm.
- Memory organisation and management, storage allocation.
- Virtual memory concepts, paging and segmentation, address mapping.
- Virtual storage management, page replacemant strategies.
- File organisation: blocking and buffering, file descriptor, directory structure
- File and Directory structures, blocks and fragments, directory tree, inodes, file descriptors, UNIX



file structure.

Course Outline				
Week	Topics			
1	Introduction			
2	Process Management			
3	Concurrency control			
4	Memory Management			
5	I/O management and Disk scheduling			
6	Inter Process Communication			
7	Multi-Processor Based and Virtualization Concepts			
8	Mid-term Exam			
9	Advanced Multi-Processor Operations			
10	Introduction to Advanced Operating System			
11	Advanced Operating System			
12	Advanced Operating System Applications			
13	Project/Homework Presentation			
14	Project/Homework Presentation			
15	Project/Homework Presentation			
16	Project/Homework Presentation			

References/Meterials/TextBooks

- 1. Operating System Concepts, 9th editionPeter B. Galvin,Greg Gagne, Abraham Silberschatz, John Wiley & Sons, Inc.
- 2. Modern Operating Systems-By Andrew S. Tanenbaum
- 3. <u>www.openbsd.org</u>

Assessment Methods					
Requirments	Qua	Grading (%)			
Mid-term Exam	1	% 30			
Homework Presentation	4	% 20			
Project Presentation	1	% 50			
	Total	100			