



# MARMARA UNIVERSITY - FACULTY OF ENGINEERING

2017-2018 Fall

CSE3033 – Operating Systems

## COURSE DESCRIPTION FORM

Offering Department		Department of Computer Engineering			Undergraduate must course (5th semester)						
Course Code		CSE3033									
Course Name		Operating Systems									
Language of Instruction		English									
ECTS		7									
Contact Hours		Theoretical (T):3			Practice (U): 0			Laboratory(L): 2			
Pre-requisites		CSE2025 – Data Structures									
Instructor		Name		Asst. Prof. Dr. Ali Haydar Özer							
		E-mail		haydar.ozer@marmara.edu.tr							
Course Materials		Mandatory		Operating System Concepts, 10th Edition, Silberschatz, Galvin, Gagne, John Wiley.							
		Recommended		Operating Systems: Internals and Design Principles, 8th edition, W. Stallings, Prentice Hall. Practical Unix Programming, K. Robbins and S. Robins, Prentice Hall.							
Course Objectives		The main aim of this course is to introduce the basic concepts of modern operating systems. Students are expected to gain experience in these concepts by doing multiple programming projects.									
Course Content		Fundamental concepts and components of operating systems. System calls. Process management and inter-process communication. Multithreaded application design using a multithread programming library. CPU scheduling algorithms. Process synchronization, synchronization structures and classic synchronization problems. Deadlocks, deadlock prevention and avoidance techniques. Memory management techniques and paging. Virtual memory management. File management and file systems. Linux programming basics.									
Learning Outcomes		LO1		To be able to define the basic concepts, objectives, components and functions of modern operating systems.							
		LO2		To be able to explain and compare various approaches proposed for fundamental problems of operating systems.							
		LO3		To be able to explain and analyze various algorithms used in operating systems.							
		LO4		To understand the basics of open source Linux operating system, to be able use Linux operating system, develop programs and do script programming.							
		LO5		To be able to write a multi-threaded application to solve a synchronization problem.							
Program Outcomes				LO1	LO2	LO3	LO4	LO5			
PO1		Adequate knowledge in mathematics, science (a) and computer engineering subjects (b) pertaining to the relevant discipline (1); ability to use theoretical and applied information in these areas to model and solve engineering problems (2).		1b	1b	1b	2	2			
PO6		Ability to work efficiently in intra-disciplinary (a) and multi-disciplinary teams (b); ability to work individually (c).					a	a			
PO14		Knowledge of data structures and algorithm analysis (a), database management systems (b), operating systems (c), software engineering (d), computer architecture (e) and automata theory (f) in computer engineering.		c	c	c	c	c			
Subjects (Knowledge, Skills and behaviors),  Contributions of Subjects to Learning Outcomes,	No	Week	Subjects	LO1	LO2	LO3	LO4	LO5			
	S1	1-2	Introduction to Operating Systems, Interrupts, CPU Execution Modes.	MF							
	S2	3	Structure of Operating Systems, System Calls, Examples to System Calls.	MF			P				
	S3	4-5	Processes and Process Management, Linux Process Management in detail.	MF			P				
	S4	6	Memory layout of Processes and an Example Memory Layout of a C Program in Linux Operating System.	MF							
Assessment Methods	S5	7	Threads and Multithreaded Programming.		MF			P			
	S6	8	CPU Scheduling Algorithms.		MF	MF					
	S7	9-10	Process Synchronization, Synchronization Tools and Classical Synchronization Problems.		MF			P			

	S8	11-12	Deadlocks, Deadlock Avoidance and Prevention Algorithms.		MF	MF				
	S9	13	Memory Management and Paging.		MF					
	S10	14	Virtual Memory Management and File Systems.		MF	MF				
Assessment Methods and Weights	No	Type	Weight	Implementation Rule		Make-up Rule				
	MF	Midterm, Final	%70	One closed-book midterm exam and one closed-book final exam are given.		Marmara University regulations will be followed for make-up exams.				
	P	Project	%30	Three programming projects are given. Students are required to work in groups of two.		-				
	TOTAL		%100							
Determining Letter Grades	<ul style="list-style-type: none"><li>The letter grades will be determined based on the midterm, final exams and 3 projects.</li><li>In order to determine the letter grade, a curve or catalog-based method will be followed based on the total average scores of the students.</li><li>The final exam score and the total average score of the student must be at least 35 to pass the course.</li><li>According to Marmara University Undergraduate regulations, the weight of the final exam must be at least 40 out of 100.</li></ul>									
	Assessment		Quizzes	Midterm	Projects	Final		TOTAL		
	Weight		10	20	30	40		100		
Teaching Method, Student Work Load	Time Applied by the Instructor									
	No	Method	Explanation						Hours	
	1	Lectures	Lectures are given in class using the board or via presentations. Example questions are solved to enhance the concepts.						14x3=42	
	2	Problem Session/ Practice	Problems related to the course topics are solved on the board.							
	3	Laboratory	Experiments are done in the laboratory or theoretical concepts covered during the lectures are practiced using computer exercises.						14x2=28	
	4	Interactive Courses	Questions are asked to students during lectures and they are encouraged to guess the answers (peer learning is also in this category)							
	5	Field Work	Students attend activities outside the campus.							
	6	Midterm	Midterm exam is given during the midterm week.						2	
	7	Final	Final exam is given during the final exam week.						2	
	Estimated Time to be Allocated by a Student									
	8	Project	The students carry out research about the problem given in the project, design and implement their solution and prepare a report.						3x18=54	
	9	Homework	The students solve the problems given as homework.							
10	Pre-class learning of Course Material	The students study and learn the new subjects from course materials.						0.5x42=21		
11	Review of Course Material	Students review the course subjects from course materials to prepare for the exams and homework.						0.5x42=21		
12	Office Hour	Students ask questions to the instructor or the assistant during office hours.						5		
TOTAL		175								
Academic Honesty	Violations of scholastic honesty include, but are not limited to cheating, plagiarizing, fabricating information or citations, facilitating acts of dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students.									
	In case academic dishonesty is observed, the first authority is the instructor of the course. The instructor may decide to give the student zero for the homework(s)/lab(s)/exam(s), give the letter grade FF, or may take disciplinary action.									