

Faculty	Faculty of Engineering	
Program	B.Sc. in Civil Engineering	Elective
	B.Sc. in Computer Engineering	Required
	B.Sc. in Electrical-Electronics Engineering	Elective
	B.Sc. in Industrial Engineering	Elective
	B.Sc. in Mechanical Engineering	Elective

Course Code	COMP 304			
Course Title in English	Operating Systems			
Course Title in Turkish	İşletim Sistemleri			
Language of Instruction	English			
Type of Course	Flipped Classroom			
Level of Course	Undergraduate			
Course Category (by % of Content)	Basic Science	Basic Engineering	Engineering Design	General Education
	0	10	80	10
Semester Offered	Fall			
Contact Hours per Week	Lecture: 3 hours	Recitation: -	Lab: -	Other: -
Estimated Student Workload	152 hours			
Number of Credits	6 ECTS			
Grading Mode	Standard Letter Grade			
Pre-requisites	Data Structures and Algorithms			
Expected Prior Knowledge	Data Structures and Algorithms / Systems Programming			
Co-requisites	None			
Registration Restrictions	Only Undergraduate Students			
Overall Educational Objective	The aim of the course is to teach students fundamentals of operating systems, design issues, algorithms and structures. Programming projects aim to provide experience to support basic concepts.			
Course Description	This course provides a comprehensive introduction to some fundamental aspects of Operating Systems. The following topics are covered: Introduction, history. Processes: basic concepts, concurrent processes, mutual exclusion, process management, scheduling approaches. Deadlock and deadlock prevention approaches. Memory management: segmentation, paging, related methods, virtual memory. Input/Output. UNIX and other example operating systems.			
Course Description in Turkish	Bu derste; İşletim Sistemlerinin temel kavramları şu konu başlıklar altında kapsamlı bir şekilde incelenmektedir: Giriş, tarihçe. Proses kavramı, eşzamanlı prosesler ve karşılıklı dışlama. Proses yönetimi ve iş sıralama yöntemleri. Ölümcül kilitlenme ve önleme algoritmaları. Bellek yönetimi: segmentasyon, sayfalama ve ilgili yöntemler. Görüntü bellek. Giriş/Çıkış işlemleri. Dosya sistemleri. Unix işletim sistemi ve diğer örnek sistemler.			
Course Learning Outcomes and Competences	Upon successful completion of the course, the learner is expected to: <ol style="list-style-type: none"> 1. comprehend the basic concepts of process management and communication; 2. demonstrate an understanding of interprocess communication techniques and apply probability to process synchronization; 3. comprehend memory management, file management, input and output handling in OS; 4. apply Unix operating system calls; 5. solve computing problems using operating system principles; 6. work as a team to identify a research paper topic; 7. present a research paper in front of an audience. 			

Relationship of the Course with the Student Outcomes	Level	Learning Outcome(s)	Assessed by
Student Outcomes	N=None S=Supportive H=High		Exam, In-class Practices, Presentation.
(1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	H	1,3	Exams
(2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	H	2,4,5	In-class Practices
(3) an ability to communicate effectively with a range of audiences	S	7	Research Paper Presentation
(4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts			
(5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	S	6	Research Paper Presentation
(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions			
(7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies			
Prepared by and Date	Asst. Prof. Dr. Şeniz Demir/ January 2020		
Semester	Spring 2019-2020		
Name of Instructor	Asst. Prof. Dr. Şeniz Demir		
Course Contents	Week	Topic	
	1.	Introduction	
	2.	Operating systems: basic concepts, classification, history	
	3.	Process management, time sharing, context switching, process management in UNIX	
	4.	Threads, thread management, thread management in UNIX	
	5.	Interprocess communication (IPC) and synchronization, semaphores, semaphores in UNIX	
	6.	Classical problems on concurrent processes	
	7.	Class work on process communication	
	8.	Deadlock, detection and avoidance, shared memory in UNIX	
	9.	Process scheduling algorithms, process scheduling in UNIX	
	10.	Class work on deadlock and scheduling	
	11.	Memory management, segmentation, paging	
	12.	Memory allocation, virtual memory management	
	13.	File systems and management, UNIX file system	
	14.	Input / Output management	
	15.	Final Exam/Project/Presentation Period	
	16.	Final Exam/Project/Presentation Period	
Required/Recommended Readings	Modern Operating Systems, Andrew Tanenbaum, Prentice Hall, 2007 Design Of The Unix Operating System, Maurice J. Bach, Prentice Hall, 1986. Operating System Concepts, Abraham Silberschatz, P. B. Galvin, Greg Gagne, Wiley, 2012.		
Teaching Methods	Flipped Classroom		
Homework and Projects	Assignments		

Laboratory Work	No
Computer Use	For in-class Practices and research paper presentation
Other Activities	
Assessment Methods	2 Midterms (35% each), In-class Practices (20%), Research Paper Presentation (10%)
Course Administration	<p>Instructor's office and phone number, office hours, email address: -Office: 5th Floor, -Email address: demirse@mef.edu.tr</p> <p>Missing a midterm: You are expected to be present without exception and to plan any travel around these dates accordingly. Medical emergencies are of course excluded if accompanied by a doctor's note. A note indicating that you were seen at the health center on the day of the exam is <u>not</u> a sufficient documentation of medically excused absence from the exam. <u>The note must say that you were medically unable to take the exam.</u> Provided that proper documents of excuse are presented, a make-up midterm will be given. In other cases, you will be given zero (0) on the exam. Employment interviews, employer events, weddings, vacations, etc. are not excused absences.</p> <p>Missing an in-class practices: A make-up will be given to an in-class practice only if proper documents of medical excuses are provided. In other cases, you will be given zero (0). Employment interviews, employer events, weddings, vacations, etc. are not excused absences.</p> <p>Eligibility to take the final exam: No final exam.</p> <p>Missing a final: No final exam.</p> <p>A reminder of proper classroom behavior, code of student conduct: YÖK Regulations</p> <p>Statement on plagiarism: YÖK Regulations</p> <p>http://3fcampus.mef.edu.tr/uploads/cms/webadmin.mef.edu.tr/4833_2.pdf</p>

ECTS Student Workload Estimation	Activity	No/Weeks	Hours			Calculation	Explanation
		No/Weeks per Semester (A)	Preparing for the Activity (B)	Spent in the Activity Itself (C)	Completing the Activity Requirements (D)		
	Lecture/Flipped Classroom	14	1	3	1	70	A*(B+C+D)
	Quizzes	5	1	0.5		7.5	
	Midterm(s)	1	3	1	0	4	A*(B+C+D)
	Assingment, Project, Presentation	7	4	3	2	63	A*(B+C+D)
	Final Examination	1	5	2	0	7	A*(B+C+D)
	Total Workload					151.5	
	Total Workload/25					6.06	
	ECTS					6	