

COMP304 Operating Systems

Spring 2014 Syllabus

Instructor	Öznur Özkasap, Associate Professor of Computer Engineering Office: Eng144, Phone: x1584, oozkasap@ku.edu.tr Office hour: Tue, Thu 15:30-16:30 (or by appointment)		
Teaching Assistants	Sena Efsun Cebeci Office: Eng142 Tue, Thu 11:00-12:00 senacebeci@ku.edu.tr	Buket Yüksel Office: Eng142 Tue, Thu 10:00-11:00 byuksel13@ku.edu.tr	Yahya H. Nazarabadi Office: Eng142 Mon, Wed 14:00-15:00 yhassanzadeh13@ku.edu.tr
Course hours	Tue, Thu 14:00 – 15:15		
PS hours	Fri 11:00 – 12:15, Fri 14:00 – 15:15		
Course web page	http://courses.ku.edu.tr/comp304		
Course material	(Storage server) F:\COURSES\UGRADS\COMP304		
Objective	An operating system is an essential part of any computer system. The purpose of this course is providing a clear understanding of the concepts that underlie operating systems. Fundamental concepts and algorithms that will be covered are based on those used in existing commercial operating systems. The aim is to present these topics in a general setting that is not tied to one particular operating system. Throughout the course, practical aspects that pertain to the most popular operating systems such as Unix/Linux and Windows, and some instructional operating systems will be studied as well.		
Description	Introduction to operating systems concepts, process management, CPU scheduling, process synchronization, thread management, deadlocks, memory management, virtual memory, distributed and network operating systems, input/output systems, file systems, protection and security, case studies of operating systems.		
Number of Credits	3		
ECTS Credits	6		
Prerequisite	Comp 303 (Computer Architecture) Good knowledge of C/Java programming languages		
Textbook	Operating System Concepts, 9th edition, Abraham Silberschatz, Peter Baer Galvin, Greg Gagne; Wiley, 2013.		
Reference books	Operating Systems, 3rd edition, Gary Nutt; Pearson/Addison Wesley, ISBN 0-201-77344-9, 2004. Modern Operating Systems, 3rd edition, Andrew S. Tanenbaum; Prentice Hall, ISBN-10: 0-13-600663-9, 2008. Operating Systems: Internals and Design Principles, 6th edition, William Stallings; Prentice Hall, ISBN-10: 0136006329, 2009.		

Course contents	<p>Introduction, operating systems concepts and strategies, multiprogramming, overview: operating system structures</p> <p>Process Management: Process concept, concurrent programming and Unix processes, operations on processes, process scheduling, cooperating processes, producer-consumer shared-memory solution</p> <p>CPU Scheduling: concepts, criteria, CPU scheduling algorithms, algorithm evaluation and performance</p> <p>Process Synchronization: race conditions, critical section problem, solutions, semaphores, busy waiting vs blocking, deadlock and starvation classical problems, monitors, condition variables, synchronization examples</p> <p>Thread Management: threads, multithreading models, POSIX Threads API, case studies of operating systems</p> <p>Deadlocks: system model, characterization, deadlock prevention, deadlock avoidance, deadlock detection and recovery</p> <p>Memory Management: contiguous memory allocation, internal and external fragmentation paging, page table structure, segmentation, operating system examples</p> <p>Virtual Memory: demand paging, page fault, page replacement algorithms, allocation of frames thrashing, working set model, other considerations, operating system examples</p> <p>Distributed Systems and Networking: network operating systems, client/server model, multithreaded server models, Unix system calls for client/server communication</p> <p>I/O Systems: mass storage structure, disk scheduling, file system, protection and security, case studies</p>										
Course elements	There will be projects and homeworks related to concepts covered in class. Besides, there will be a midterm and a final exam. During class/PS hours, quizzes may be given, in order to help students better understand the material and follow the course attentively. Note that, late projects and homeworks will not be accepted.										
Attendance and Policy	The students are required to attend classes on time. Random attendance will be taken. During the lectures, use of laptops, cell phones, or other similar devices is forbidden.										
Exam schedule	Midterm: March 18, Tuesday (tentative) Final: Finals' week (May 22-June 2, 2014)										
Grading	<table border="0"> <tr> <td>Projects</td> <td>25%</td> </tr> <tr> <td>Homeworks</td> <td>15%</td> </tr> <tr> <td>Midterm</td> <td>25%</td> </tr> <tr> <td>Final</td> <td>30%</td> </tr> <tr> <td>Class participation and quizzes</td> <td>5%</td> </tr> </table> <p>These weights are subject to minor adjustments. Note that, your project and homework averages should be at least 50 in order to get a passing grade.</p>	Projects	25%	Homeworks	15%	Midterm	25%	Final	30%	Class participation and quizzes	5%
Projects	25%										
Homeworks	15%										
Midterm	25%										
Final	30%										
Class participation and quizzes	5%										
Academic Honesty	The students taking this course are expected to submit their own work in all homeworks, projects and exams. Academic dishonesty includes using other people's words or ideas without acknowledgement, cheating on exams, projects, and homeworks. In case any of the academic dishonesties are disclosed, disciplinary action and/or reduction of the final letter grade will follow.										