جامعة الملك عبدالله
للعلوم والتقنية
King Abdullah University of
Science and Technology

Course Syllabus: Systems Programming - CS 140

Division	Computer, Electrical and Mathematical Sciences & Engineering
Course Number	CS 140
Course Title	Systems Programming
Academic Semester	Spring
Academic Year	2018/2019
Semester Start Date	01/27/2019
Semester End Date	05/23/2019
Class Schedule (Days & Time)	01:00 PM - 02:30 PM | Mon Thu

Instructor(s)

Name	Email	Phone	Office Location	Office Hours
Malek Smaoui	Malek.Smaoui@KAUST.EDU.SA	+966128080331	4303, 1, Al-Khawarizmi (bldg. 1)	Sun, Mon, Wed, Thu 9:00 to 12:00 by appointment. Please eamil one day before for appointments.

Teaching Assistant(s)

Name	Email

Course Information

Comprehensive Course Description	Topics include: Processes and their interactions (critical sections, cooperation), higher-level synchronization mechanisms, the OS kernel, process and thread scheduling, deadlocks (detection, prevention), physical memory management, virtual memory (paging, segmentation, page replacement algorithms, load control), linking and sharing, file systems, principles of input/output, protection and security (authentication, threats, cryptography, access control, information flow control)
Course Description from Program Guide	This course provides a comprehensive and unified introduction to operating systems and concurrency control topics. It emphasizes both design issues and fundamental principles in contemporary systems and gives students a solid understanding of the key structures and mechanisms of operating systems. It also prepares the students to master concurrent and parallel programming by exposing the concepts of parallelism, synchronization and mutual exclusion. The course discusses design trade-offs and the practical decisions affecting design, performance and security. The course illustrates and reinforces design concepts and ties them to real-world design choices through the use of case studies.
Goals and Objectives	-Give students a good understanding of the basic principles underlying general operating systems and the various design trade-offs. -Students will be able to write pseudo code as well as actual code to solve some of the above problems. -Students will be able to analyze and evaluate various trade-offs inherent to the design of systems software.
Required Knowledge	Familiarity with programming in a high-level language, such as C, C++, or Java.

Reference Texts	Required textbook: -Operating Systems Concepts. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, ed 9, 2012, Wiley.
Method of evaluation	**30.00**% - Final exam **30.00**% - Midterm exam **10.00**% - Homework /Assignments **30.00**% - Course Project(s)
Nature of the assignments	Homeworks: -Weekly homework problems to be turned in via blackboard by the posted due date. -Solutions to homework problems will be discussed after the due date -Students are encouraged to discuss the solutions as well as pose any questions/problems they may encounter on a common discussion forum set up on blackboard for this purpose. The discussions will be monitored by the instructor and the TA, who will also correct any misunderstandings or clarify unanswered issues. Programming projects: -There will be two or three programming projects to complete, each dealing with a different part of an operating system. -Projects will be presented in lectures and will be due on the dates posted on the course website.
Course Policies	**Late work** -Late work (homework and projects) will be accepted, but a penalty of 10% per day will be imposed. No late homework will be accepted once the solutions have been presented. **Plagiarism** -You are not allowed to reuse in your projects any portion of a design or code developed by another person or group (during this semester or any previous semesters). Any violation of this rule will result in a failing grade for this course. -The same applies to all homework assignments.
Additional Information	

Tentative Course Schedule *(Time, topic/emphasis & resources)*		
Week	**Lectures**	**Topic**
1	Mon 01/28/2019 Thu 01/31/2019	Introduction
2	Mon 02/04/2019 Thu 02/07/2019	Processes and their interaction
3	Mon 02/11/2019 Thu 02/14/2019	Higher-level interaction schemes
4	Mon 02/18/2019 Thu 02/21/2019	The OS Kernel
5	Mon 02/25/2019 Thu 02/28/2019	Scheduling
6	Mon 03/04/2019 Thu 03/07/2019	Deadlocks
7	Mon 03/11/2019 Thu 03/14/2019	Physical memory
8	Mon 03/18/2019 Thu 03/21/2019	Midterm
9	Mon 03/25/2019 Thu 03/28/2019	Spring Break
10	Mon 04/01/2019 Thu 04/04/2019	Virtual memory
11	Mon 04/08/2019 Thu 04/11/2019	Linking and sharing
12	Mon 04/15/2019 Thu 04/18/2019	File systems
13	Mon 04/22/2019 Thu 04/25/2019	I/O
14	Mon 04/29/2019 Thu 05/02/2019	The protection and security interface
15	Mon 05/06/2019 Thu 05/09/2019	Internal protection mechanisms
16	Mon 05/13/2019 Thu 05/16/2019	Final
17	Mon 05/20/2019 Thu 05/23/2019	Final Exam Week

Note

The instructor reserves the right to make changes to this syllabus as necessary.