CEng 334 - Introduction to Operating Systems
Syllabus
Spring '2019-2020

Course Description
The course will cover the following topics: Introduction to operating systems. Memory management. Process management. Concurrent processes. Deadlocks. Processor management. I/O and device management. File management and File systems. Introduction to distributed operating systems. Synchronization in distributed systems. Distributed file systems. Overview of contemporary OS technology.

CEng 334 provides knowledge for understanding the general concept of operating systems which are basic computation infrasturcture for all kinds of computer applications. Course fills in the gap between the computer architecture and the user applications needing O.S. services. It enables students to develop systems applications and libraries, high performance and concurrent software applications, design and administer computation infrastructures.

Course Objectives
Students taking this course will be able to:

- Understand design and implementation of operating systems.
- Understand data structures and memory organization mechanisms of a complex software systems.
- Understand resource sharing mechanisms of a complex software system.
- Understand concurrent data exchange mechanisms of a complex software system.
- Verify data integrity in concurrent systems.
- Design and implement algorithms for problems requiring concurrency and synchronization.
- Understand authentication and security requirements of an operating system.
- Understand contemporary system infrastructures used in computation.

Prerequisites: CEng 331 (Computer Organization)
Instructors:
S1: Dr. Erol Şahin, A-207, erol@ceng.metu.edu.tr
S2: Dr. Onur Tolga Şehitoğlu, B-209, onur@ceng.metu.edu.tr

Teaching assistants:
Çağrı Utku Akpak (A-205, `cakpak@ceng.metu.edu.tr`)
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Hakan Bostan (B-203, `hbostan@ceng.metu.edu.tr`)
Orhun Buğra Baran (?, ?)

Lectures:
S1: Monday 10:40-12:30 (BMB3), and Thursday 08:40-10:30 (BMB3).[1]
S2: Tuesday 15:40-17:30 (BMB4) and Thursday 13:40-14:30 (BMB4).

Textbooks:

- Operating System Concepts, by Silberschatz, Galvin and Gagne Wiley.

- Modern Operating Systems, 3rd Edition, by Tanenbaum, Prentice Hall.

- Little book of semaphores, by Allen B. Downey, Grean Tea Press (free for download)

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[1]second hour reserved for make up lectures in case some classes are cancelled.

Course Schedule

Date	Topic	Activity
3 − 6 Feb	Introduction and OS Overview	
10 − 13 Feb	Processes, Threads	
17 − 20 Feb	Threads	Prog. Assignment 1, IPC
24 − 27 Feb	Synchronization	
2 − 5 Mar	Synchronization: Semaphores	
9 − 12 Mar	Synchronization: Monitors and Condition Variables, Deadlocks	Prog. Assignment 2, concurrency and synchronization
16 − 19 Mar	Scheduling	Midterm I
23 − 26 Mar	Scheduling	
30 Mar − 2 Apr	Memory Management and Virtual Memory	
6 − 9 Apr	Memory Management and Virtual Memory	
13 − 16 Apr	Disks and Filesystems	
20 − 23 Apr	Filesystems Interface, I/O systems	Midterm II
27 − 30 Apr	Multi-processor systems, virtualization	Prog. Assignment 3, Filesystems
4 − 7 May	OS Security	

All dates are tentative, subject to change

Exams and Grading:

Midterm I	21%
Midterm II	21%
Final	23%
Assignments	30%
Pop quiz	5%

Communication:

- Course web page: `https://cengclass.ceng.metu.edu.tr` (Enroll ceng334)
- Most of the announcements related to course conduct will be in class
- Official announcements and discussion on course content,
  `https://cow.ceng.metu.edu.tr/c/courses-undergrad/ceng334/`
- Questions that are general or related to content should be posted to the newsgroup.
- Course conduct related questions should be posted to the instructor and/or teaching assistants in private. Make sure you include "CENG 334" in the subject line

Policies:

- Late submission penalty $= 5d^2$, d is number of days of late submission.

- Students need to collect 25/100 in average from programming assignments announced before the final exam (typically first two assignments). Otherwise **student will not be qualified for final and graded as NA**.

- All works submitted should be fully your own and individual. We have a zero tolerance policy on cheating and plagiarism. All attempts will be subject to disciplinary action.