CENG 709 - COMPUTER ARCHITECTURE AND OPERATING SYSTEMS

Midterm Date: April 24

Instructor: Prof. Dr. Ahmet Cosar (cosar@metu.edu.tr)

Textbook:

- "Modern Operating Systems" Andrew S. Tanenbaum; Prentice Hall; 2/e; ISBN: 0-13-595752-4.
- "Computer System Architecture" Morris Mano; Prentice Hall; 3/e; ISBN: 0-13175738-5

Contents (subject to change):

1. Introduction
2. Data representation
3. Boolean Algebra and Digital logic Circuits
4. Simplification of Boolean Functions
5. Combinational Logic
6. Synchronous Sequential Logic
7. Registers, Counters, and the Memory Unit
8. Register Transfer and Microoperations
9. Basic Computer Organization and Design
10. Machine Instruction and Addressing Modes
11. Central Processing Unit
12. Memory Organization
13. Introduction and overview of the operating systems. History, concepts, and structure.
14. Processes. Concurrency issues and Process Concept. Inter-process communication (IPC): pipes, sockets, semaphores.
15. CPU scheduling.
16. Memory Management. Memory partitioning with and without Swapping. Virtual memory management: Paging. Segmentation. Page replacement algorithms. Modeling paging algorithms. Design issues.
17. File Systems. Files and Directories. Implementation issues of file systems. Security and protection mechanisms.
18. Input/Output. Principles of I/O hardware and software. Disks and disk scheduling, clocks, and terminals.
19. Deadlocks. Resources and deadlocks. Deadlock detection, recovery, avoidance, and prevention.
20. Case operating systems: UNIX

Grading:

Midterm Exam	40%
Final Exam	40%
Assignments	2 x 10%