

COURSE DESCRIPTION

Department and Course Number	CS 440	Course Coordinator	Behzad Parviz
Course Title	Introduction to Operating Systems	Total Credits	4

Current Catalog Description:

Resource, memory, and process management; concurrent processing; deadlock prevention; file system implementation; mass storage management.

Textbook:

Silberschatz, Galvin and Gagne, Wiley. *Operating System Concepts, 7th Edition*. John Wiley & Sons, 2003.

References:

Tanenbaum,. *Modern Operating Systems, 2nd Edition*, Prentice Hall, 2001.

Course Goals:

At the end of the course, students will have an understanding of the main concepts of modern Operating Systems. They will have learned the interrelationships among users and hardware components. Covered topics include process and threads management, CPU scheduling, process synchronization, deadlocks handling, memory management, and storage management.

Prerequisites by Topic:

- Proficiency in at least one programming language such as C/C++ or Java
- Data structures and algorithms
- Introduction to Operating Systems and Networks

Major Topics Covered in the Course:

- Introduction to Operating System Concepts
- Operating System Structures
- Processes
- Threads
- CPU Scheduling
- process Synchronization
- Deadlocks
- Main Memory Management
- Virtual Memory Management
- File System Interface
- File System Implementation

- Mass Storage Structure

Laboratory Projects (specify number of weeks on each):

- Process creation and evaluation (2 weeks)
- Process scheduling simulation (3 weeks)
- CPU scheduling evaluation (2 weeks)
- Inter-process coordination and communication (2 weeks)

Estimate Curriculum Category Content (Quarter Hours)

Area	Core	Advanced	Area	Core	Advanced
Algorithms	1.0		Data Structures	1.0	
Software Design	1.0		Prog. Languages		
Comp. Arch.	1.0				

Oral and Written Communications:

Written documentation of software built in labs and homework assignments.

Social and Ethical Issues:

No significant component.

Theoretical Content:

No significant component except for the queuing analysis discussed during the process scheduling coverage, logic design, and algorithm development.

Problem Analysis:

In this course, students learn the basic concepts of modern operating systems such as: resource, memory, and process management; concurrent processing; deadlock prevention; file system implementation; and mass storage management.

Solution Design:

Solution design in this course mostly involves lab project assignments for process creation, simulation of many scheduling algorithms and their comparison, and resource management.