



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Systems II: Introduction to Operating Systems

CSE 5431

Credit Hours:

2.00

Course Levels:

Undergraduate (1000-5000 level)

Graduate (5000-8000 level)

Course Components:

Lecture

Course Description:

Introduction to operating system concepts: process, CPU scheduling, memory management, file system and storage, and multi-threaded programming.

Prerequisites and Co-requisites:

Prereq: 5042 or equiv.

Course Goals / Objectives:

- Be competent with process concepts and CPU scheduling
 - Be competent with memory hierarchy and memory management
 - Be familiar with process control blocks, system calls, context switching, interrupts, and exception control flows
 - Be familiar with process synchronization, inter-process communication, and threads
 - Be familiar with multi-threaded programming
 - Be familiar with file systems and disk scheduling algorithms
 - Be familiar with principles and practices of security and privacy in computing.
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Course Topics:

- Introduction to operating systems, overview of related computer architecture concepts (CPU modes of operation, exceptions/interrupts, clock).
 - Process concepts, process control block, memory and CPU protection, process hierarchy, shell, process (Unix-like) related system calls, interactions between systems calls, context switching and underlying interrupt, timer mechanisms.
 - Process interactions, exception control flow (classes of exceptions, exception handling, private address space, user and kernel modes, process control, loading and running programs, Unix fork and exec system calls, signals).
 - Process (CPU) scheduling (Various CPU scheduling algorithms).
 - Process synchronization (e.g., critical section problem, synchronization problems), deadlock and inter-process communication, threads.
 - Multi-thread programming.
 - Memory hierarchy.
 - Memory management (contiguous allocation, paging, segmentation, virtual memory).
 - File systems (file system hierarchy, i-node, files, directories, file system management and optimization).
 - Disk allocation and disk arm scheduling.
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Designation:

Elective