THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Systems II: Introduction to Operating Systems

CSE 2431

Credit Hours:
3.00

Course Levels:
Undergraduate (1000-5000 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: 2421, or 2451 and ECE 2560; and enrollment in CSE, CIS, Data Analytics, Engr Physics, or ECE major.

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.

Course Topics:

- 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 synchronization (e.g., critical section problem, synchronization problems), deadlock and inter-process communication, threads
- Process (CPU) scheduling (various CPU scheduling algorithms)
- 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

Designation:

Required
Elective