

**Brief Course Description**  
(50-words or less)

Coverage of the key concepts in modern operating systems. Specific topics include process management, synchronization mechanisms, scheduling strategies, deadlock detection/avoidance, memory management, file systems, protection and security, and distributed systems. Concepts will be reinforced through programming projects using a realistic operating system

**Extended Course Description / Comments**

N/A

**Pre-Requisites and/or Co-Requisites**

CSCI 4720  
Computer Architecture and Organization

**Required, Elective or Selected Elective**

Selected Elective Course

**Approved Textbooks**  
(if more than one listed, the textbook used is up to the instructor's discretion)

Authors: Abraham Silberschatz, Bell Laboratories Peter Baer Galvin, Corporate Technologies  
Greg Gagne, Westminster College  
Title: *Operating System Concepts*  
Edition: 8th or later  
ISBN-13: 978-1118112731

Authors: Andrew S Tanenbaum and Albert S Woodhull  
Title: *Operating Systems Design and Implementation*  
Edition: 3rd or later  
ISBN-13: 978-0131429383

**Specific Learning Outcomes (Performance Indicators)**

At the completion of this course students should be able to do the following:

1. Describe and explain the processes and threads, and the concepts of inter-process communication and synchronization.
2. Describe the context switch, and components of process scheduling: process control blocks, the interrupts, the ready queue, CPU scheduling algorithms.
3. Design, implement and analyze concurrent programs using semaphores or monitors, with the awareness of race conditions, deadlock, and starvation.
4. Describe and apply memory management concepts: virtual and physical address spaces, paging, segmentation, page sharing and protection, page replacement algorithms, and translation lookaside buffer.
5. Define, restate, discuss, and explain mass storages, disk scheduling, and file systems.

**Relationship Between Student Outcomes and Learning Outcomes**

Specific Learning Outcomes	ABET Learning Outcomes					
		a	b	c	d	e
1	●		●			●
2	●		●			●
3	●	●			●	●
4	●	●	●			●
5	●	●	●		●	●

**Major Topics Covered**  
(Approximate Course Hours)

3 credit hours = 37.5 contact hours

4 credit hours = 50 contact hours

Note: Exams count as a major topic covered

Operating System Structure (5 hours)

Processes (6 hours)

Threads (4 hours)

Scheduling (5 hours)

Synchronization (6 hours)

Deadlock (4 hours)

Memory (6 hours)

File System (6 hours)

Advanced Concepts, such as Protection & Security, Concurrency, I/O Subsystem, Mass Storage, Time Management in Distributed Systems (6 hours)

**Course Master**

Dr. Maria Hybinette