COP 4610 – Computer Operating Systems

Description: Functions and characteristics of operating systems. Process management. Resource allocation and scheduling. Cooperating processes. Memory organization and management. I/O system. Case studies.

Textbook: A. Silberschatz, P.B. Galvin, and G. Gagne, *"Operating System Concepts"*, John Wiley & Sons, Inc., 2002.

Class Notes: B. Furht, *"Computer Operating Systems – COP 4610,"* John Wiley & Sons, Inc. 2001.

Instructor: Borko Furht, Professor of Computer Science and Engineering
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Office Hours: CSE #422, MW 10:00 – 12:00 A.M

Objectives:

- To provide fundamental concepts applied in modern operating systems, including process management, memory organization and management, and I/O management
- To apply the design of collaborative processes and threads and their synchronization using semaphores
- To understand the problem of deadlock and their solutions
- To provide knowledge of various memory organizations and management techniques
- To provide knowledge of basic principles of I/O management
- To develop simulation program for evaluation of CPU schedulers
- To design an application using a multithreading system

Prerequisites: COP 3510 - Data Structures and Algorithms and
CDA 3331 - Introduction to Microcomputers

Topics:

1. Functions and Characteristics of Operating Systems
2. Process Management – Process Concept
3. Resource Allocation and Scheduling
4. Process Collaboration and Synchronization
5. Deadlocks and Their Prevention
6. Memory Organization and Management – Real Memory
7. Virtual Memory Organization
8. Virtual Memory Management
9. Input/Output Management and Disc Scheduling
10. Case Studies

Grading format:	Two Programming Assignments (20% x 20%)	40%
	Two Tests (2x30%)	60%
	TOTAL	**100%**

STUDENT LEARNING OUTCOMES	RELATED TOPICS
2. Proficiency in the areas of software design and development, data structures, and operating systems	• Process management • Process collaboration and synchronization • Memory organization • Virtual memory management • I/O management
5. An ability to communicate effectively and to function on multidisciplinary teams	• Project 1: Design and evaluation of CPU schedulers • Project 2: Design of a multithreading system