

## CSCI 5342 - OPERATING SYSTEMS CONCEPTS

**CREDIT HOURS:** 3  
**PREREQUISITES:** CSCI 3342; CSCI 4341 or 5340  
**GRADE REMINDER:** Must have a grade of C or better in each prerequisite course.

### CATALOG DESCRIPTION

Operating system structures, concurrent processes, resource scheduling, memory management, file systems and protection, distributed systems.

### PURPOSE OF COURSE

To present fundamental concepts of operating systems, problems associated with multi-user and multitasking environments, and currently implemented solutions to these problems.

### EDUCATIONAL OBJECTIVES

Upon successful completion of the course, students should be able to:

1. Describe the concept, purpose, functions, and structures of operating systems.
2. Demonstrate an understanding of machine architectural characteristics affecting the design and implementation of operating systems.
3. Identify software techniques for correctly managing concurrent processes in single CPU computing systems.
4. Describe methods of managing computer system resources such as processors, memory, and files, and techniques for handling inter-process communication.
5. Identify essential concepts of parallel and distributed systems.

### COURSE CALENDAR

This course meets for a minimum of 37.5 lecture contact hours during the semester. Students have significant assignments based on readings from the primary literature, participate in classroom discussions regarding current research topics, complete periodic homework and laboratory/programming assignments, and periodic exams in addition to the final exam. Students are expected to prepare for any class assignments or quizzes over the material covered in class or in the reading material. Successful completion of these activities requires at a minimum six additional hours of outside of classroom work each week.

### CONTENT

### Hours

Overview of Operating System Services and Organization .....	4
Process/Task Management .....	6
Characteristics of processes	
Operations on processes	
Scheduling criteria and algorithms	
Memory Management .....	10

Partitioned Memory	
Paging	
Segmentation	
Virtual memory	
Demand paging	
Page replacement algorithms	
Concurrent Process Management .....	10
Process deadlock	
Process coordination	
synchronization	
mutual exclusion	
event ordering	
interprocess communication	
File Systems .....	6
Directories	
Allocation methods	
Access methods	
Protection	
Distributed Systems .....	6
Case Studies .....	3
	TOTAL
	45

## REFERENCES

Coffman, E.G. and Denning, P., Operating Systems Theory, Prentice-Hall, 1973.

Lane, M.G. and Mooney, J.D., A Practical Approach to Operating Systems, Boyd and Fraser, 1988.

Silberschatz, A. and Galvin, P., Operating Systems Concepts, 4<sup>th</sup> Ed., Addison-Wesley, 1994.

Tanenbaum, A.S. and Woodhull, A.S., Operating Systems: Design and Implementation, 2<sup>nd</sup> Ed., Prentice-Hall, 1997.