EC-312A	OPERATING SYSTEMS (ELECTIVE - II)	L	T	P	C
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COURSE OBJECTIVES:

1. To understand the underlying principles, techniques and approaches which constitute a coherent body of knowledge in Operating Systems.
2. To understand the inherent functionality and processing of program execution.
3. To understand how the various elements that underlie operating system interact and provides services for execution of application software.

COURSE OUTCOMES:

After successful completion of the course, the students are able to

1. understand the structures of an operating system and the design issues associated with operating systems.
2. interpret about the memory management including virtual memory.
3. illustrate the concept of synchronization and deadlocks.
4. analyse about process management concepts, scheduling and multithreading concepts.
5. assess the issues related to file system interface, implementation and disk management.

UNIT I **(13)**

Introduction : Operating System Structure, Operating system operations, process management, memory management, storage management, protection and security, distributed systems, special purpose systems, computing environments.

System structure : Operating System Services, user operating system interface, system calls, types of system calls, system programs, operating system design and implementation, operating system structure, virtual machine, operating system generation, system boot.

UNIT II **(13)**

Process Concept : Process concept, process scheduling, operations on processes, inter process communication, examples of IPC systems, communication in client server systems.

Multithreaded Programming : Overview, multithreading models, thread libraries, threading issues, operating system examples, Process Scheduling: Basic Concepts, Scheduling Criteria Scheduling Algorithms, Thread scheduling, multiple processor scheduling.

UNIT III **(13)**

Synchronization : Background, The critical section problem, Peterson's solution, Synchronization Hardware, Semaphores, Classic Problem of synchronization, monitors, synchronization examples, Atomic Transaction Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock detection, Recovery from Deadlock.

UNIT IV **(13)**

Memory Management strategies : Background, Swapping, Contiguous Memory allocation, Paging, Structure of the page table, segmentation, Virtual Memory Management: Background, Demand Paging, Copy on Write page replacement, Allocation of Frames, Thrashing.

UNIT V **(10)**

File System : File Concept-Access Methods-Directory and disk structure-file system mounting- File Sharing, Protection. Implementing File Systems: File System Structure-File System, Implementation, Directory Implementation, Allocation methods-free space management, Efficiency and performance, recovery, **Secondary Storage Structure :** Overview of Mass-Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling, Disk Management, Swap Space Management, RAID structure.

LEARNING RESOURCES:

TEXT BOOK(s):

Silberschatz and Galvin - Operating System Concepts, 7th Edition, John Wiley & Sons (Asia) Pvt. Ltd.

REFERENCE BOOK(s):

1. William Stallings - Operating Systems-Internals and Design Principles, 5th Edition, Pearson
2. Charles Crowley - Operating Systems: A Design-Oriented Approach, TMH 1998

WEB RESOURCES:

1. http://nptel.iitm.ac.in/courses/
2. http://www.mike-willis.com/Tutorial/PF2.htm