

**IV B.Tech – I Semester**  
**(17CS741) OPERATING SYSTEMS (from CSE) (Open Elective-I)**

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	3	1	-	3

**Pre-Requisites: Knowledge on computer hardware, basic c programming**

**Course Objectives:**

- Study the basic concepts and functions of operating systems.
- Understand the structure and functions of OS.
- Learn about Processes, Threads and Scheduling algorithms.
- Understand the principles of concurrency and Deadlocks.
- Learn various memory management schemes.
- Study I/O management and File systems.
- Learn the basics of Linux system and perform administrative tasks on Linux Servers.

**UNIT-I:** Introduction to Operating System Concept: Types of operating systems, operating systems concepts, operating systems services, Introduction to System call, System call types.

**UNIT-II:** Process Management – Process concept, The process, Process State Diagram , Process control block, Process Scheduling- Scheduling Queues, Schedulers, Operations on Processes, Interprocess Communication, Threading Issues, Scheduling-Basic Concepts, Scheduling Criteria, Scheduling Algorithms.

**UNIT-III:** Memory Management: Swapping, Contiguous Memory Allocation, Paging, structure of the Page Table, Segmentation Virtual Memory Management: Virtual Memory, Demand Paging, Page-Replacement Algorithms, Thrashing

**UNIT-IV:** Concurrency: Process Synchronization, The Critical- Section Problem, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Monitors, Synchronization examples Principles of deadlock – System Model, Deadlock Characterization, Deadlock Prevention, Detection and Avoidance, Recovery from Deadlock

**UNIT-V:** File system Interface- the concept of a file, Access Methods, Directory structure, File system mounting, file sharing, protection. File System implementation- File system structure, allocation methods, free-space management Mass-storage structure overview of Mass-storage structure, Disk scheduling, Device drivers,

**UNIT-VI:** Linux System: Components of LINUX, Inter process Communication, Synchronisation, Interrupt, Exception and System Call. Android Software Platform: Android Architecture, Operating System Services, Android Runtime Application Development, Application Structure, Application Process management

**Course Outcomes:**

CO-1	Survey the operating system services.	L1
CO-2	Evaluate Scheduling algorithms for process management.	L5
CO-3	Evaluate process synchronization techniques for concurrency.	L5
CO-4	Compare various memory management schemes.	L4
CO-5	Evaluate Process synchronization techniques for deadlocks.	L5
CO-6	Analyze the structure of file systems on secondary storage devices.	L4

**Correlation of COs with POs & PSOs:**

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	3	2	1	2	-	-	-	-	-	-	-	-	2	2	2
CO-2	2	3	1	2	2	-	-	-	-	-	-	-	-	2	-
CO-3	3	3	1	2	2	-	-	-	-	-	-	-	1	2	-
CO-4	3	3	1	2	2	-	-	-	-	-	-	-	1	2	-
CO-5	3	2	2	2	2	-	-	-	-	-	-	-	2	2	-
CO-6	2	2	2	2	-	-	-	-	-	-	-	-	1	2	2

**Text Book:**

1. Operating System Concepts, Abraham Silberschatz, Peter Baer Galvin and Greg Gagne 9th Edition, John Wiley and Sons Inc., 2012.
2. Operating Systems – Internals and Design Principles, William Stallings, 7th Edition, Prentice Hall, 2011.
3. Operating Systems-S Halder, Alex A Aravind Pearson Education Second Edition 2016 .

**Reference Books:**

1. Modern Operating Systems, Andrew S. Tanenbaum, Second Edition, Addison Wesley, 2001.
2. Operating Systems: A Design-Oriented Approach, Charles Crowley, Tata Mc Graw Hill Education”, 1996.
3. Operating Systems: A Concept-Based Approach, D M Dhamdhare, Second Edition, Tata Mc Graw-Hill Education, 2007.