III Year II Semester   **L   T   P   C**

Code: 17CS648   **3   1   0   3**

OPERATING SYSTEMS
(Open Elective-I)

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, Inter process 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 form 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, Interprocess Communication, Synchronisation, Interrupt, Exception and System Call. Android Software Platform: Android Architecture, Operating System Services, Android Runtime Application Development, Application Structure, Application Process management

OUTCOMES:
• Design various Scheduling algorithms.
• Apply the principles of concurrency.
• Design deadlock, prevention and avoidance algorithms.
• Compare and contrast various memory management schemes.

• Design and Implement a prototype file systems.
• Perform administrative tasks on Linux Servers
• Introduction to Android Operating System Internals

TEXT BOOKS:
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 .

REFERENCES:
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 Dhamdhere, Second Edition, Tata Mc Graw-Hill Education, 2007.