II Year II Semester

Code: 17CS401

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OPERATING SYSTEMS

OBJECTIVES:
1. Study the basic concepts and functions of operating systems.
2. Understand the structure and functions of OS.
3. Learn about Processes, Threads and Scheduling algorithms.
4. Understand the principles of concurrency and Deadlocks.
5. Learn various memory management schemes.
6. Study I/O management and File systems.
7. 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:
Concurrency: Process Synchronization, The Critical- Section Problem, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Monitors, Synchronization examples.

UNIT IV:
Deadlock: Principles of deadlock – System Model, Deadlock Characterization, Deadlock Prevention, Detection and Avoidance, Recovery form Deadlock

UNIT V:
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 VI:
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,

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 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 .

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.