5Th Semester

Operating Systems

Objectives

- To provide knowledge about the services rendered by operating systems
- To provide a detailed discussion of the various memory management techniques
- To discuss the various file-system design and implementation issues
- To discuss how the protection domains help to achieve security in a system

Module I: **(8 Hours)**

Operating Systems –Definition- Types- Functions -Abstract view of OS- System Structures –System Calls- Virtual Machines –Process Concepts –Threads –Multithreading

Module II: **(4 Hours)**

Process Scheduling- Process Co-ordination –Synchronization –Semaphores –Monitors Hardware Synchronization –Deadlocks –Methods for Handling Deadlocks

Module III: **(12 Hours)**

Memory Management Strategies –Contiguous and Non-Contiguous allocation –Virtual memory Management –Demand Paging- Page Placement and Replacement Policies

Module IV: **(6 Hours)**

File System –Basic concepts - File System design and Implementation –Case Study: Linux File Systems - Mass Storage Structure –Disk Scheduling –Disk Management –I/O Systems-System Protection and Security.

Module V: **(10 Hours)**

Distributed Systems –Distributed operating systems –Distributed file systems –Distributed Synchronization

Outcomes

- Ability to comprehend the techniques used to implement the process manager
- Ability to comprehend virtual memory abstractions in operating systems
- Ability to design and develop file system interfaces, etc.

Books:

[1] Silberschatz, Galvin, Gagne, "Operating System Concepts", John Wiley and Sons, 10th edition, 2018

[2] Stallings, “Operating Systems –Internals and Design Principles”, 9/E, Pearson Publications, 2018

[3] Andrew S. Tanenbaum, “Modern Operating Systems”, 4/E, Pearson Publications, 2015