

**Course Objective:** 1. To provide an understanding of the fundamental concepts of operating systems.  
2. To provide insight into the functional modules of operating systems.  
3. To study the concepts underlying the design and implementation of operating systems.

**S. NO****Course Outcomes (CO)****CO1**

Ability to understand the basic concepts and functions of operating systems.

**CO2**

Ability to understand Processes, Threads, and Deadlocks

**CO3**

Ability to analyze Scheduling algorithms

**CO4**

Ability to analyze memory management schemes.

**CO5**

Ability to understand I/O management and File systems.

**S. NO****Contents****Contact Hours****UNIT 1**

Introduction: Operating system and function, Evolution of operating system, Batch, Interactive, Time Sharing and Real Time System, System protection.  
Operating System Structure: System Components, System structure, Operating System Services

**6****UNIT 2**

Concurrent Processes: Process concept, Principle of Concurrency, Producer Consumer Problem, Critical Section problem, Semaphores, Classical problems in Concurrency, Inter Process Communication,  
Process Generation, Process Scheduling.  
CPU Scheduling: Scheduling Concept, Performance Criteria of Scheduling Algorithm, Evolution, Multiprocessor Scheduling.

**10****UNIT 3**

Deadlock: System Model, Deadlock Characterization, Prevention, Avoidance and Detection, Recovery from deadlock combined approach.

**8****UNIT 4**

Memory Management: Base machine, Resident monitor, Multiprogramming with fixed partition, Multiprogramming with variable partition, Multiple base register, Paging, Segmentation, Virtual memory concept, Demand paging, Performance, Paged replacement algorithms, Allocation of frames, Thrashing, Cache memory organization, Impact on performance.

**10****UNIT 5**

I/O Management & Disk Scheduling: I/O devices and organization of I/O function, I/O Buffering, DISK I/O, Operating System Design Issues.  
File System: File Concept, File Organization and Access Mechanism, File Directories, File Sharing, Implementation Issues

**8****TOTAL****42****REFERENCES****S.No.****Name of Books/Authors/Publishers****Year of Publication / Reprint****1**

Silberschatz, A, Galvin, P.B., Gagne G., "Operating System Concepts" 10th edition, Wiley Publishers.

2018

**2**

Stallings W, "Operating Systems ", 9th edition, Pearson Education

2018

**3**

Maurice Bach, "Design of Unix Operating System", PHI.

2013

**B.Tech. Information Technology****Course code: Course Title****Course Structure****Pre-Requisite**

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