

OPERATING SYSTEM

Course Code: CI45	Credits: 3:0:0
Pre – requisites: Nil	Contact Hours: 42L
Course Coordinator: Akshatha G C	

Unit I

Introduction: What operating systems do; Computer System organization; Computer System architecture; Operating System structure; Operating System operations;

Operating system structures: operating system services, user operating system Interface, System calls, Types of system calls, Operating system structure, System boot.

- Pedagogy/Course delivery tools: Chalk and talk, PowerPoint Presentation, Videos
- Links: <https://nptel.ac.in/courses/106105214>
- Impartus recording: <https://a.impartus.com/ilc/#/course/148805/703>

Unit II

Process Management: Basic concept; Process scheduling; Operations on processes; Inter process Communication.

Threads: Overview; Multithreading models;

Process scheduling: Basic concepts, Scheduling criteria, scheduling algorithms, multiple processor scheduling, Algorithm evaluation.

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Unit III

Process Synchronization: Synchronization, The Critical section problem; Peterson's solution; Synchronization hardware; Semaphores; Classical problems of synchronization; Monitors.

Deadlocks: System model; Deadlock characterization; Methods for handling deadlocks; Deadlock prevention; Deadlock avoidance; Deadlock detection and recovery from deadlock.

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Unit IV

Memory Management Strategies: Background; Swapping; Contiguous memory allocation; Paging; Structure of page table; Segmentation.

Virtual Memory Management: Background; Demand paging; Copy-on write; Page replacement; Allocation of frames; Thrashing.

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Unit V

File System: File concept; Access methods; Directory structure; File system mounting; file sharing; protection.

Secondary Storage Structures: Disk scheduling; FCFS Scheduling, SSTF scheduling, SCAN, C-SCAN scheduling, Look Scheduling, CLOOK scheduling.

System Protection: Goals of protection, Principles of protection, Domain of protection, Access matrix.

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Suggested Learning Resources

Text Books:

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne Operating System Principles, 8th edition Wiley- India, 2011

Reference Books:

1. D.M Dhamdhare Operating systems - A concept-based Approach, 2nd Edition, Tata McGraw-Hill, 2002
2. Harvey M Deital Operating systems, 3rd Edition, Addison Wesley, 1990.
3. Operating Systems: Principles and Practice (2nd Edition), by Thomas Anderson and Michael Dahlin.

Course Outcomes (COs):

At the end of the course students will be able to:

1. Describe the structure of computer system and services provided by Operating system.
2. Apply different scheduling algorithms for Process/Memory/Disk Management
3. Describe Process management and need for controlled access to computing resources by co-operative processes.
4. Apply deadlock detection and prevention algorithms to solve the given problem
5. Illustrate memory management strategies and operating system principles for achieving protection and security.

Course Assessment and Evaluation:

Continuous Internal Evaluation (CIE): 50 Marks		
Assessment Tools	Marks	Course Outcomes (COs) addressed
Internal Test-I (CIE-I)	30	CO1, CO2
Internal Test-II CIE-II)	30	CO3, CO4, CO5
Average of the two CIE shall be taken for 30 marks		
Other Components		
Case study	10	CO1, CO2, CO3
Assignment	10	CO4, CO5
The Final CIE out of 50 Marks = Average of two CIE tests for 30 Marks+ Marks scored in Quiz +Marks scored in Assignment		
Semester End Examination (SEE)		
Course End Examination (Answer One full question from each Unit- Internal Choice)	100	CO1, CO2, CO3 CO4, CO5