राष्ट्रीय प्रौद्योगिकी संस्थान पटना / NATIONAL INSTITUE OF TECHNOLOGY PATNA
संगणक विज्ञान एंव अभियांत्रिकी विभाग / DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
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No:- Date:

CS34111 Operating Systems

L-T-P-Cr: 3-0-2-4

Pre-requisites: Algorithms and computer organizational architecture

Objectives:

- To understand concepts of OS, process & process scheduling.
- To understand process synchronization and deadlocks handling methods.
- To learn about File Systems, Disk Management and Memory Management.

Course Outcomes:

S.NO	Outcomes	Mapping to PO
CO-1	Familiarize with the basic concepts of OS, process, process scheduling	PO1, PO2, PO3
CO-2	Learn about process synchronization and deadlock handling methods	PO2, PO3, PO4,
CO-3	Understand the concept of memory management and virtual memory	PO2, PO3
CO-4	Learn about various file systems and disk management techniques	PO2, PO3, PO4

UNIT I **Lectures: 14**

Introduction: Introduction to OS. Operating system functions, evaluation of O.S., Different types of O.S.: batch, multi-programmed, time-sharing, real-time, distributed, parallel.

Processes*:* Concept of processes, process scheduling, operations on processes, inter-process communication, Communication in Client-Server Systems, overview & benefits of threads.

Process scheduling: scheduling criteria, preemptive & non-preemptive scheduling, scheduling algorithms.

UNIT II **Lectures: 10**

Process Synchronization*:* background, critical section problem, critical region, synchronization hardware, classical problems of synchronization, semaphores.

Deadlocks*:* system model, deadlock characterization, methods for handling deadlocks, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock.

UNIT III **Lectures: 10**

Memory Management*:* background, logical vs. physical address space, swapping, contiguous memory allocation, paging, segmentation.

Virtual Memory*:* background, demand paging, page replacement, page replacement algorithms, allocation of frames, thrashing.

UNIT IV **Lectures: 8**

File Systems*:* File concept, access methods, directory structure

Disk Management*:* disk structure, disk scheduling (FCFS, SSTF, SCAN, C-SCAN)

Text/Reference Books:

1) *Operating System Principles* by Silberschatz A. and Peterson J. L., Wiley
2) *Operating Systems* by Dhamdhere, TMH
3) *Operating Systems* by Deitel, Deitel & Choffnes.
4) *Operating Systems* by Stalling, Pearson