OPERATING SYSTEMS

Credits:4 **Semester: II**
Subject Code: DS19204 **No. of Lecture Hours: 75**

Objective: To learn the core ideas in operating systems, process management, memory protection, CPU scheduling, concurrent programming, deadlocks and file systems

Outcomes: Students will be able to
CO1: Identify the main components of an OS & their functions
CO2: Analyze various issues in Inter Process Communication (IPC) and the role of OS in IPC.
CO3: Explain Process synchronization, Deadlocks-deadlock characterization, methods for handling deadlocks.
CO4: Compare the concepts and implementation Memory management policies and virtual memory.
CO5: Understand the working of an OS as a resource manager, file system manager, process manager, memory manager and I/O manager and methods used to implement the different parts of OS

UNIT – I **15hrs**

1. Introduction-What is an operating system, mainframe system, desktop systems 2
2. Multiprocessor systems, distributed systems, clustered systems 2
3. Real time systems , hand held systems 2
4. Operating system structures-system components 3
5. Operating system services, system calls 3
6. System programs, system structures , virtual machines 3

UNIT – II **15hrs**

1. Process concept-process concept, PCB, process scheduling 4
2. Operation on processes, cooperating processes 3
3. Inter process communication 3
4. Process scheduling-basic concepts, scheduling criteria, Scheduling algorithms. 5

UNIT – III **15hrs**

1. Process synchronization-critical section problem 4
2. Semaphores, monitors 3
3. Deadlocks-deadlock characterization, methods for handling 4
4. deadlocks
5. Deadlock prevention, Deadlock avoidance, Deadlock detection and Recovery 4

UNIT-IV **15hrs**

1.	File system-file concept, access methods	4
2.	Directory structure, file system mounting, file system sharing.	4
3.	File system implementation-file system structure, file system implementation.	

UNIT – V **15hrs**

1.	Memory management-swapping, contiguous memory allocation	3
2.	Fragmentation-internal and external fragmentation	3
3.	Paging, segmentation, segmentation with paging.	3
4.	Virtual memory management-demand paging	3
5.	Page replacement algorithms, Thrashing and working set model.	3