OPERATING SYSTEMS

Course Code	23IT3401	Year	II	Semester	II
Course Category	PC	Branch	IT	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Data structures
Continuous Interna Evaluation :	30	Semester End Evaluation:	70	Total Marks:	100

Course Outcomes		Blooms Level
Upon successful completion of the course, the student will be able to:		
CO1	Understand the structure and functionalities of operating systems	L2
CO2	Apply different algorithms of CPU scheduling, Page replacement and disk scheduling.	L3
CO3	Apply various concepts to solve problems related to process synchronization and deadlocks.	L3
CO4	Analyze and interpret the functionalities of operating system.	L4

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial,2:Moderate,1:Slight)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3												3	
CO2		3							3				3	
CO3		3							3				3	
CO4		3								3			3	
Avg.	3	3							3	3			3	

Syllabus

Unit No.	CONTENTS	Mapped CO
I	**Operating Systems Overview:** Introduction, Operating system functions, Operating systems operations, Computing environments, Free and Open-Source Operating Systems **System Structures:** Operating System Services, User and Operating-System Interface, system calls, Types of System Calls, system programs, Operating system Design and Implementation.	CO1
II	**Processes:** Process Concept, Process scheduling, Operations on processes, Inter-process communication. **Threads and Concurrency:** Multithreading models, Thread libraries, Threading issues. **CPU Scheduling:** Basic concepts, Scheduling criteria, Scheduling algorithms, Multiple processor scheduling.	CO1, CO2, CO4
III	**Synchronization Tools:** The Critical Section Problem, Peterson's Solution, Mutex Locks, Semaphores, Classic problems of Synchronization, Monitors. **Deadlocks:** system Model, Deadlock characterization, Methods for handling Deadlocks, Deadlock prevention, Deadlock avoidance, Deadlock detection, Recovery from Deadlock.	CO1, CO3, CO4

IV	**Memory-Management Strategies:** Introduction, Swapping, Contiguous memory allocation, Paging, Structure of the Page Table. **Virtual Memory Management:** Introduction, Demand paging, Copy-on-write, Page replacement, Allocation of frames, Thrashing **Storage Management:** Overview of Mass Storage Structure, HDD Scheduling.	**CO1, CO2, CO4**
V	**File System:** File System Interface: File concept, Access methods, Directory Structure; **File system Implementation:** File-system structure, File-system Operations, Directory implementation, Allocation method, Free space management; **File System Internals:** File-System Mounting, Partitions and Mounting, File Sharing. **Protection:** Goals of protection, Principles of protection, Protection Rings, Domain of protection, Access matrix.	**CO1, CO4**

Learning Resources

Text Books

1. Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley, 2018.
2. Modern Operating Systems, Tanenbaum A S, 4th Edition, Pearson , 2016

Reference Books

1. Operating Systems -Internals and Design Principles, Stallings W, 9th edition, Pearson, 2018
2. Operating Systems: A Concept Based Approach, D.M Dhamdhere, 3rd Edition, McGraw- Hill, 2013

E-Resources & other digital material

1. https://archive.nptel.ac.in/courses/106/102/106102132/
2. http://peterindia.net/OperatingSystems.html