OPERATING SYSTEMS

Course Code	20IT3501	**Year**	III	**Semester**	I
Course Category	PC	**Branch**	IT	**Course Type**	Theory
Credits	3	**L-T-P**	3-0-0	**Prerequisites**	Programming for Problem Solving, Data structures
Continuous Internal 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 various concepts to solve problems related to process synchronization, deadlocks and make an effective report.	L3
CO3	Apply different algorithms of CPU scheduling, Page replacement and disk scheduling.	L3
CO4	Analyze process, memory and storage management strategies**. (Assignment)**	L4

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:High, 2: Medium, 1:Low)

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

SYLLABUS		
Unit No	**Contents**	**Mapped CO**
I	**Overview:** Introduction - What Operating Systems Do, Computer-System Organization, Computer-System Architecture, Operating-System Structure, Operating-System Operations Operating System Structures - Operating-System Services, User and Operating-System Interface, System Calls, Types of System Calls.	CO1
II	**Process Management:** Process Concept, Process Scheduling, Operations on Processes, Interprocess Communication. Threads - Overview, Multicore Programming, Multithreading Models. Process Scheduling - Basic Concepts, Scheduling Criteria, Scheduling Algorithms (First-Come, First-Served Scheduling, Shortest-Job-First Scheduling, Priority Scheduling, Round-Robin Scheduling.)	CO1,CO3,CO4
III	**Process Synchronization:** Background, The Critical-Section Problem, Peterson's Solution, Synchronization Hardware, Mutex Locks, Semaphores, Classic Problems of Synchronization. Deadlocks - System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.	CO1, CO2

IV	**Memory Management:** Main Memory- Background, Swapping, Contiguous Memory Allocation, Segmentation, Paging, Structure of the Page Table. Virtual Memory - Background, Demand Paging, Copy-on-Write, Page Replacement, Basic Page Replacement, FIFO Page Replacement, Optimal Page Replacement, LRU Page Replacement, LRU-Approximation Page Replacement.	CO1, CO3,CO4
V	**Storage Management:** File–System Interface**:** File Concept, Access Methods, Directory and Disk Structure. File–System Implementation - File-System Structure, File-System Implementation, Directory Implementation, Allocation Methods. Mass-Storage Structure - Overview of Mass-Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling, FCFS Scheduling, SSTF Scheduling, SCAN Scheduling, C-SCAN Scheduling, LOOK Scheduling, Selection of a Disk-Scheduling Algorithm.	CO1, CO3,CO4

Learning Resources	
Text book:	
1	Operating System Concepts, Abraham Silberchatz, Peter Baer Galvin, Greg Gagne, Ninth Edition, 2016, Wiley India.
References:	
1	Operating Systems - Internal and Design Principles, William Stallings, Ninth Edition, 2018, Pearson.
2	Operating Systems - Harvey M.Deitel, Paul J Deitel and David R.Choffnes , Third Edition, 2019, Pearson.
3	Operating Systems - A Concept based Approach- D.M. Dhamdhere, Second Edition, 2010, McGraw Hill.
e-Resources and other Digital Material:	
1	https://www.youtube.com/watch?v=z3Nw5o9dS7Q&list=PLsylUObW5M3CAGT6OdubyH6FztKfJCcFB
2	http://www.youtube.com/watch?v=MaA0vFKtew&list=PL88oxI15Wi4Kw1aEY2bC5l_4pouojjtd4