OPERATING SYSTEMS

Course Code	20EC4701D	Year	IV	Semester	I
Course Category	PE-III	Branch	ECE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Data structures, Computer Organization and Architecture
Continuous Internal Evaluation	30	Semester End Evaluation	70	Total Marks	100

Course Outcomes	
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: High, 2: Medium, 1: Low)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2
CO1	3												3	
CO2	3								2	2			3	
CO3	3								2	2			2	
CO4		2							2	2			3	
Over all weights	3	2							2	2			3	

Unit No.	SYLLABUS	Mapped COS
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.	CO 1, CO2, CO3
II	**Process Management:** Process Concept, Process Scheduling, Operations on Processes, Inter-process Communication. **Threads:** Overview, Multi-core 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.)	CO 1, CO 2, CO4
III	**Process Synchronization:** Background, The Critical-Section Problem, Peterson's Solution, Synchronization Hardware, Mutex Locks, Semaphores, Classic Problems of Synchronization, Monitors.	CO 1, CO 3, CO4

	Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.	
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, Allocation of Frames, Thrashing.	CO 1, CO 2, 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**.**	CO 1, CO 2, CO4

Learning Resource

TEXT BOOKs

1. Abraham Silberchatz, Peter Baer Galvin, Greg Gagne, Operating System Concepts, 9th Ed., 2016, Wiley India
2. William Stallings, Operating Systems - Internal and Design Principles, 9th Ed., 2018, Pearson.

REFERENCE BOOKS:

1. Harvey M.Deitel, Paul J Deitel and David R.Choffnes , Operating Systems - 3rd Ed. , 2019, Pearson.
2. D.M. Dhamdhere, Operating Systems - A Concept based Approach- 2nd Ed., 2010, McGraw Hill**.**

_E-RESOUCES

1. https://onlinecourses.nptel.ac.in/noc19_cs50/
2. http://www.youtube.com/watch?v=MaA0vFKtew&list=PL88oxI15Wi4Kw1aEY2bC5l_4po uojjtd4