OPERATING SYSTEMS

Course Code	20EE4701E	Year	IV	Semester(s)	I
Course Category	Professional Elective-III	Branch	EEE	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 diskscheduling (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	PO10	PO11	PO12	PSO1	PSO2
CO1	3													
CO2	3								2	2				
CO3	3								2	2				
CO4		2							2	2			1	

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, CO2, CO3**
II	**Process Management:** Process Concept, Process Scheduling, Operations on Processes, Inter-process Communication. **Threads:** Overview, Multi-core Programming, Multithreading Models.	**CO1,**

	Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms (First-Come, First-Served Scheduling, Shortest-Job-First Scheduling, Priority Scheduling, Round-Robin Scheduling.)	**CO2, CO4**
III	**Process Synchronization:** Background, The Critical-Section Problem, Peterson's Solution, Synchronization Hardware, 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**
I V	**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.	**CO1, CO2, CO4**
V	**Storage Management:** **File–System Interface:** File Concept, Access Methods, Directoryand 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, CO2, CO4**

Learning Resources
Text Books
4. Abraham Silberchatz, Peter Baer Galvin, Greg Gagne, Operating System Concepts, Wiley India, Ninth Edition, 2016,.
Reference Books
1. William Stallings , Operating Systems - Internal and Design Principles, Pearson, Ninth Edition, 2018. 2. Harvey M.Deitel, Paul J Deitel and David R.Choffnes, Operating Systems -, Pearson, Third Edition,2019. 3. D.M. Dhamdhere, Operating Systems - A Concept based Approach-, McGraw Hill, Second Edition, 2010,.
Web Links 1. https://onlinecourses.nptel.ac.in/noc19_cs50/ 2. http://www.youtube.com/watch?v=MaA0vFKtew&list=PL88oxI15Wi4Kw1aEY2bC5l_4pouojjtd4