Title of Paper: Operating System

Sr.No.	Heading	Particulars
1	**Description the course :** **Including but Not limited to:**	Introduce operating system concepts (i.e., processes, threads, scheduling, synchronization, deadlocks, memory management, file systems and protection) Introduce the issues to be considered in the design and development of operating system (memory, file and disk).
2	**Vertical :**	**Major**
3	**Type :**	Theory
4	**Credits :**	2 credits (1 credit = 15 Hours for Theory in a semester, Total 30 hours)
5	**Hours Allotted :**	30
6	**Marks Allotted:**	30
7	**Course Objectives(CO):**	1. Understand basic knowledge of computer operating system 2. structures and functioning. 3. Understand the process management mechanism 4. CO 3. Ability to apply CPU scheduling algorithms to manage tasks. 5. CO 4. Discuss methods of prevention and recovery from system deadlock 6. CO 5. Understand the implementation of file systems and directories
8	**Course Outcomes (OC):**	1. Outline the basic concept of operating systems 2. Analyze the working of operating system 3. Examine the working of various scheduling approaches 4. Apply the concepts of synchronization and deadlock 5. Apply the file access mechanisms
9	**Modules:-** **Module 1:**	
	Operating System Overview: Basics of operating systems: Generations, Types, Structure, Services, System Calls, System Boot, System Programs, Protection and Security. **Process Management**: Process Concepts, Process States, Process Control Block, Scheduling-Criteria, Scheduling Algorithms and their Evaluation, Threads, Threading Issues. **Process Synchronization:** Background, Critical-Section Problem, Peterson's Solution. Synchronization Hardware, Semaphores, Classic Problems of Synchronization.	**15 Hrs**
	Module 2:	
	Memory Management: Main Memory, Swapping, Contiguous Memory Allocation, Paging, Structure of Page Table, Segmentation, Virtual Memory, Demand Paging, Page Replacement Algorithms, Allocation of Frames, Thrashing. **Deadlock:** System Model, Deadlock Characterization, Deadlock Prevention, Detection and Avoidance, Recovery from Deadlock. **File System Interface:** File Concept, Access Methods, Directory Structure, and File System Structure.	15 Hrs

10	**Books and Reference:**
	1. Operating Systems – Internals and Design Principles William Stallings, Pearson 9th , 2009
	2. Operating System Concepts, Abraham Silberschatz, Wiley, 8th Edition
	3. Operating Systems, Godbole and Kahate, Godbole and Kahate, 3rd Edition.

12	**Internal Continuous Assessment: 40%**	**Semester End Examination: 60%**

13	**Continuous Evaluation through:** Class test of 1 of 15 marks Class test of 2 of 15 marks Average of the two: 15 marks Quizzes/ Presentations/ Assignments: 5 marks Total: 20 marks	**Format of Question Paper: External Examination (30 Marks)– 1 hr duration**

14	**Format of Question Paper: (Semester End Examination : 30 Marks. Duration:1 hour)** Q1: Attempt any two (out of four) from Module 1 (15 marks) Q2: Attempt any two (out of four) from Module 2 (15 marks) Or Q1: Attempt any three (out of five) from Module 1 (15 marks) Q2: Attempt any three (out of five) from Module 2 (15 marks)