Semester Lecture Plan

Name of the college: Government College of Arts, Science and Commerce, Sanquelim - Goa

Name of Faculty: Nilesh Natekar	**Subject:** Computer Science	
Paper code: CSC204 – Operating System	**Program/Course: S.Y.B.Sc.**	**Division: A**
Academic year: 2024 - 2025	**Semester: IV**	**Total Lectures: 60**

Course Objectives:

- To understand the fundamental concepts of operating systems.
- To understand process management and synchronization techniques.
- To gain knowledge on the memory management techniques.
- To analyze the various techniques in storage management and file management.

Course Learning Outcome:

On completion of the course, students will be able to:

CO1. Remember the concepts of operating systems, its structure and process management.
CO2. Understand process synchronization techniques to formulate solution for critical section problems and CPU scheduling algorithms.
CO3. Apply memory management schemes of operating system.
CO4. Analyze the storage management and file management techniques of operating systems.

Month	Lectures From: To:	No. of lectures allotted	Topic, Subtopic to be covered	Learning outcome	ICT Tools	Reference books

December	09/12/2024	14/12/2024	04	**Introduction to Operating Systems:** Concept of Operating Systems Computer System Organization Computer System Architecture **Operating System Structures:** Services	1. Explain basics of OS	Laptop, LCD Projector, Powerpoint Presentation	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2018). Operating Systems Concepts. Wiley India
December /January	16/12/2024	04/01/2025	04	User and Operating System Interface, System Calls and its types System Programs, Operating System Structure (Simple, Layered, Microkernel, Modules, Hybrid), System Boot **Process Management:** Process (Concept, State, Process Control Block, Threads) Process Scheduling (Scheduling Queues)	1. Explain OS structure 2. Process Management	Laptop, LCD Projector, Powerpoint Presentation	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2018). Operating Systems Concepts. Wiley India

January	06/01/2025	11/01/2025	04	Process Scheduling (Schedulers, Context switching) Operation on Processes (Creation, Termination) Inter-process Communication (Shared Memory Systems) Inter-process Communication (Message Passing Systems)	1. Explain Process Scheduling 2. Explain IPC	Laptop, LCD Projector, Powerpoint Presentation	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2018). Operating Systems Concepts. Wiley India
January	13/01/2025	18/01/2025	04	**Threads:** Concept Multicore Programming Multithreading Models **Process Synchronization:** Concept, Critical-Section Problem	1. Explain Threads, multicore and multithreading	Laptop, LCD Projector, Powerpoint Presentation	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2018). Operating Systems Concepts. Wiley India
January	20/01/2025	25/01/2025	04	Peterson's Solution Synchronization Hardware, Mutex Locks, Semaphores Classic Problems of Synchronization	1. Understand Process Synchronization 2. Solve Classic Problems	Laptop, LCD Projector, Powerpoint Presentation	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2018). Operating Systems Concepts. Wiley India

				(Bounded-Buffer Problem) Classic Problems of Synchronization (Readers-Writers Problem)			
January / February	27/01/2025	01/02/2025	04	Classic Problems of Synchronization (Dining-Philosophers Problem) **CPU Process Scheduling:** Basic Concepts **CPU Process Scheduling:** Scheduling Criteria Scheduling Algorithms (First-Come-First-Serve, Shortest-Job First)	1. Understand CPU Scheduling Process	Laptop, LCD Projector, Powerpoint Presentation	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2018). Operating Systems Concepts. Wiley India
February	03/02/2025	08/02/2025	04	Scheduling Algorithms (Priority Scheduling, Round Robin) **Deadlocks:** System model, Characterization Methods for handling Deadlocks,	1. Explain Deadlocks 2. Explain Deadlock prevention, avoidance	Laptop, LCD Projector, Powerpoint Presentation	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2018). Operating Systems Concepts. Wiley India

				Deadlock Prevention Deadlock Avoidance (Safe State, Resource-Allocation-Graph Algorithm)			
February	10/02/2025	15/02/2025	04	Deadlock Avoidance (Banker's Algorithm) Deadlock Detection, Recovery from Deadlock **Memory Management:** Concept Swapping	1. Explain Deadlock detection and recovery	Laptop, LCD Projector, Powerpoint Presentation	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2018). Operating Systems Concepts. Wiley India
February	17/02/2025	22/02/2025	04	Contiguous Memory Allocation Segmentation Segmentation Paging	1. Explain Memory Management techniques	Laptop, LCD Projector, Powerpoint Presentation	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2018). Operating Systems Concepts. Wiley India
February / March	24/02/2025	01/03/2025	04	Paging Structure of the Page Table **Virtual Memory:** Demand Paging Copy-on-Write	1. Explain Memory Management techniques 2. Explain Virtual Memory	Laptop, LCD Projector, Powerpoint Presentation	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2018). Operating Systems Concepts. Wiley India

March	03/03/2025	08/03/2025	04	Page Replacement (Basic, FIFO) Page Replacement (Optimal, LRU) Allocation of Frames Thrashing (Concept, Causes)	1. Understand Page Replacement 2. Explain Allocation of frames and thrashing	Laptop, LCD Projector, Powerpoint Presentation	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2018). Operating Systems Concepts. Wiley India
March	10/03/2025	15/03/2025	04	Thrashing (Concept, Causes) **Storage Management:** Overview of Mass-Storage Structure Disk Structure Disk Attachment, Disk Scheduling (FCFS, SSTF)	1. Explain Storage Management and Disk Structure	Laptop, LCD Projector, Powerpoint Presentation	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2018). Operating Systems Concepts. Wiley India
March	17/03/2025	22/03/2025	04	Disk Scheduling (SCAN, C-SCAN) RAID (Concept, Levels of RAID) **File System:** File Concept Access Methods	1. Understand Disk Scheduling methods 2. Explain File System	Laptop, LCD Projector, Powerpoint Presentation	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2018). Operating Systems Concepts. Wiley India
March	24/03/2025	29/03/2025	04	Directory and Disk Structure File Sharing Protection	1. Explain Directory structure, file sharing and protection	Laptop, LCD Projector, Powerpoint Presentation	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2018). Operating Systems Concepts. Wiley India

				File-System Implementation: Structure			
March /April	31/03/2025	05/04/2025	04	File-System Implementation Directory Implementation Allocation Methods Allocation Methods	1. Explain File System implementation 2. Explain Allocation methods	Laptop, LCD Projector, Powerpoint Presentation	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2018). Operating Systems Concepts. Wiley India
April	07/04/2025	11/04/2025		REVISION REVISION REVISION	1. REVISION	Laptop, LCD Projector, Powerpoint Presentation	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2018). Operating Systems Concepts. Wiley India