Thread

Syllabus

Unit	Contents	Lectures
1.	Introduction to Operating System Introduction to operating System. Basic Functions of Operating System. Simple Batch Systems, Multi Programmed Batch Systems, Time-Sharing Systems, Parallel System, Distributed systems, Real-Time Systems. Computer System structure- Computer System Operation, I/O Structure (I/O Interrupts and DMA Structure) Storage Structure, Storage Hierarchy and Hardware Protection (Dual Mode Operation, I/O Protection, Memory Protection and CPU protection).	5
2.	Operating System Structure System Components (Process Management, Main Memory Management, File Management, I/O System Management, Secondary Storage Management, Networking, Protection System and Command Interpreter System), Operating System Services (Program Execution, I/O Operations, File System Manipulation, Communication and Error detection).	5
3.	Process Process Concept (Process, Process State, Process Control Blocks), Process Scheduling (Scheduling Queues, Schedulers and Context Switching) Operations of Processes (Process Creation and Process Termination), Inter Process Communication (Information Sharing, Computation Speedups, Modularity and Convenience), Thread (Thread Structure) and difference between Thread and Process.	5

Syllabus

Unit	Contents	Lectures
4.	CPU Scheduling CPU scheduling (CPU-I/O Burst Cycle, CPU Scheduler, Types of Scheduling (Pre-emptive and Non-Pre-Emptive Scheduling and Dispatcher), Scheduling Criteria (CPU Utilization, Throughput, Turnaround Time, Waiting Time and Response Time), Scheduling Algorithms (First Come First Served Scheduling, Shortest Job First Scheduling, Priority Scheduling, Round Robin Scheduling, Multi Level Queue Scheduling, Multi Level Feedback Queue Scheduling.	8
5.	Memory Memory Management (Address Binding (Compile Time, Load Time and Execution Time), Dynamic Loading, Dynamic Linking and Overlays). Comparison between Logical and Physical Address Space. Swapping. Contiguous Allocation (Single Partition Allocation, Multiple Partition Allocation and External and Internal Fragmentation), Paging (Idea of Paging, Page Table Structure, Multi Level Paging, Inverted Page Table and Shared Pages), Segmentation (idea of Segmentation, Hardware Support, Implementation of Segment Tables, Protection and Sharing and Fragmentation). Virtual memory (Idea of Virtual Memory, Demand Paging, Page Replacement, Page Replacement Algorithms (First In First Out Algorithm and Least Recently Used Algorithm). Thrashing.	12

Syllabus

Unit	Contents	Lectures
6.	File File (Idea of File, File Attributes, File Operations, File Types and File Structure), File System Structure (File System Organization, File Allocation Methods (Contiguous Allocation, Liked Allocation, Indexed Allocation)), Free Space Management (Bit Vector, Linked List, Grouping and Counting).	5
7.	Introduction to Linux / Unix • What is Linux / Unix Operating systems • Difference between Linux / Unix and other operating systems • Features and Architecture • Various Distributions available in the market • Installation, Booting and shutdown process • System processes (an overview) • External and internal commands • Creation of partitions in OS • Processes and its creation phases – Fork, Exec, wait	5

Syllabus

Unit	Contents	Lectures
8.	Shell introduction and Shell Scripting • What is shell and various type of shell, Various editors present in Linux • Different modes of operation in vi editor • What is shell script, Writing and executing the shell script • Shell variable (user defined and system variables) • System calls, Using system calls • Pipes and Filters • Decision making in Shell Scripts (If else, switch), Loops in shell • Functions • Utility programs (cut, paste, join, tr , uniq utilities) • Pattern matching utility (grep)	5

Thread

- A thread is a flow of execution through the process code, with its own program counter that keeps track of which instruction to execute next, system registers which hold its current working variables, and a stack which contains the execution history.

Thread …

- A thread shares with its peer threads few information like code segment, data segment and open files. When one thread alters a code segment memory item, all other threads see that.

Thread …

- A thread is also called a lightweight process. Threads provide a way to improve application performance through parallelism. Threads represent a software approach to improving performance of operating system by reducing the overhead thread is equivalent to a classical process.

Thread …

- Each thread belongs to exactly one process and no thread can exist outside a process. Each thread represents a separate flow of control. Threads have been successfully used in implementing network servers and web server. They also provide a suitable foundation for parallel execution of applications on shared memory multiprocessors.

Thread …

- The following figure shows the working of a single-threaded and a multithreaded process.

Thread …