

MIT(CS)-304

Introduction to Operating System

Block-1

Unit-1

Introduction to Operating system , User and System View , The Evolution of operating system, Operational View ,Processes and Tools ,Trends in Computing , Parallel Computing , Real - Time Systems ,Wireless Systems

Unit-2

File Systems and Management ,File Types and Operations ,File Access Rights ,File Access and Security Concerns ,File Storage Management , Inode in Unix ,File Control Blocks, The Root File System , Block-based File Organization , Disk Partitions , Portable storage

Unit-3

Introduction to Processes and Process management , Main Memory Management ,Files and IO Management ,Process Management ,Processor Utilization ,Response Time ,Process States ,A Queuing Model ,Scheduling ,Choosing a Policy ,Policy Selection ,Comparison of Policies ,Pre-emptive Policies ,How to Estimate Completion Time ,Exponential Averaging Technique , Two Level Schedules ,Kernel Architecture ,System Calls ,Layered Design ,The Virtual Machine Concept ,System Generation , Introduction to Linux, The Linux Distribution ,Linux Design Considerations ,Components of Linux

Unit-4

Introduction to memory management ,Main Memory Management ,Memory Relocation Concept ,Compiler Generated Bindings ,Linking and Loading Concepts ,Process and Main Memory Management ,The First Fit Policy: Memory Allocation ,The Best Fit Policy: Memory Allocation ,Fixed and Variable Partitions ,Virtual Storage Space and Main Memory Partitions ,Virtual Memory: Paging ,Mapping the Pages ,Paging: Implementation , Page Replacement Policy ,Thrashing The TLB scheme Additional Points ,Segmentation

Block -2

Unit-1

Introduction to Input Output (IO) Management ,Issues in IO Management ,Managing Events ,IO Organization ,Programmed Data Mode ,Polling ,Interrupt Mode ,Issues in Handling Interrupts

,DMA Mode of Data Transfer , HW/SW Interface ,Device Drivers ,Handling Interrupt Using Device Drivers ,Management of Buffers , Disk Scheduling ,Disk Scheduling Policies

Unit-2

Introduction to Resource sharing and Management ,Need for Scheduling ,Mutual Exclusion ,Deadlocks ,Deadlock Prevention Method ,Deadlock Detection and Prevention Algorithms ,Mutual Exclusion Critical Sections , Semaphores ,Usage of Semaphore

Unit-3

Introduction to Inter-Process communication ,Creating A New Process: The fork() System Call ,Assigning Task to a Newly Spawned Process ,Establishing Inter-process Communication ,Pipes as a Mechanism for Inter-process Communication ,Shared Files ,Shared Memory Communication ,Message-Based IPC ,Signals as IPC

Unit-4

Introduction to Real-time Operating Systems and Microkernels , Characteristics of real-time systems , Classification of Real-time Systems , Microkernels and RTOS ,OS for Hand-held Devices ,Rate Monotonic Scheduling ,Earliest Deadline First Policy ,Earliest Least Laxity First Policy ,Priority Inversion

Block-3

Unit-1

Introduction to OS and Security ,Security Breaches ,Examples of Security Breaches ,Attack Prevention Methods ,User Authentication ,Security Policy and Access Control

Unit-2

Introduction to Unix Primer , Unix Environment , Unix File System ,Unix Commands ,Unix Portability

Unit-3

Search and Sort Tools , grep, egrep and fgrep ,Sort Tool ,AWK Tool in Unix , AWK Syntax , AWK Grammar

Unit-4

Shell Scripts in UNIX , Facilities Offered by Unix Shells ,The Shell Families ,Subshells ,The Shell Programming Environment , Unix Kernel Architecture ,User Mode and Kernel Mode ,System Calls , Process States in Unix ,Kernel Operations ,The Scheduler, Linux Kernel ,Linux Sources and URLs

Block-4

Unit-1

Make Tool In UNIX , How Make Works ,Macros, Abstractions, and Shortcuts ,Inference Rules in Make , Mastermakefiles

Unit-2

Tar and Other Utilities , Image File Formats for Internet Applications, Performance Analysis and Profiling ,Source Code Control System in UNIX , The SCCS ,SCCS Command Structure ,CVS : Concurrent Versioning System

Unit-3

X Windows in UNIX ,Graphical User Interface (GUI) , X-Window System ,Some Standard X-clients ,Hosts ,Selecting a host for Display ,X-Utilities ,Startup ,Motif and X

Unit-4

System Administration in UNIX ,Unix Administration Tasks ,Administration Tasks List ,Starting and Shutting Down ,Managing User Accounts ,The .rc Files ,Sourcing Files ,Device Management and Services ,The Terminal Settings ,Printer Services ,Disk space allocation and management

Unit-5

The Linux Kernel ,Purpose of the Kernel ,The Linux Kernel Structure Overview ,Process Management ,Scheduler ,The Memory Manager ,The Virtual File System (VFS) ,The Network Interface , Linux File Systems ,Device specific files ,The Virtual File system ,The VFS Structure and file management in VFS: ,The Second Extended File System (EXT2FS) ,Advanced Ext2fs features ,Physical Structure ,The EXT3 file system ,THE PROC FILE SYSTEM ,DEVICE DRIVERS ON LINUX ,Device classes ,Block devices ,Network devices , The file operations structure(fops), Blocking and non-blocking operations ,Asynchronous Notification ,Interrupt Handling in LINUX ,Top Half And Bottom Half Processing ,Linux Installation