CSH205: Operating Systems

Teaching Scheme	Examination Scheme
Lectures: 4 hrs/Week Tutorials: 2 hr/Week Credits: 6	Class Test -20 Marks Teachers Assessment – 10 Marks Attendance – 20 Marks End Semester Exam – 100 marks

Prerequisite: *- DOS, Microprocessor peripherals and interfacing*

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Course Objectives:

1. Define and list the functions of an operating system.
2. list resources involved in process creation and management.
3. Explain the use of paging and segmentation
4. Explain the function and structure of the I/O system.
5. Describe path names and directory structure visible to end users
6. To familiarize the students with the Operating System.
7. To demonstrate the process, memory, file and directory management issues under the UNIX operating system.
8. To introduce UNIX basic commands.
9. To make students how to make simple programs in UNIX and administrative task of UNIX.

Detailed Syllabus

UNIT I (8 Hours) **Introduction:** Operating System, Operating System Services & Functions. Simple Batch Systems, Multiprogrammed Batched Systems, Time Sharing Systems, Real-Time Systems. **Process:** Process Concept, Process Scheduling, CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms with examples.
UNIT II (8 Hours) **Process Communication and Synchronization:** Co-operating Process, Inter-process communication, Threads (Thread Concept, Single and Multiple Threads, Benefits). Introduction to process synchronization, Critical Section Problem.
UNIT III (8 Hours) **Deadlock:** Deadlocks: Deadlock Characterization, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, and Recovery from Deadlock.
UNIT IV (16 Hours) **Introduction to UNIX**: features of UNIX, Shell Vs Kernel, types of shell, System Calls, System calls Vs Library functions, UNIX file System, The Parent-Child Relationship, Orphan, Zombie, UNIX Architecture, UNIX Commands. The first faltering step(Login), Password, Password Ageing, files related commands, Symbolic links, Listing Files & directories, Hidden files, Shell Meta characters, Masking file permission, Changing file permission(Absolute & Symbolic mode), Sticky bit, Directory related commands, Best calculator.
UNIT V (10 Hours) **The UNIX file system** INODE Table, Disk related commands, File related commands, Filters, I/O redirection & Piping, Command substitution. **Process** basic, process status, Mechanism of process creation, Job Control, background processes, Killing a process, Daemon, Changing process priorities, Scheduling a process.
UNIT VI (6 Hours) System Administration in UNIX- the System administrator's login, the administrator's privileges, Adding & Removing groups, user's management, Booting & Shutdown, Making a file system, Mounting & Unmounting File system.
Text and Reference Books 1. Operating System concepts, A. Silberschatz, Peter B. Galvin, Addison Wesley publishing Company, 6th Edition 2.UNIX shell programming By Yashvant Kanetkar ---BPB Publications 3.UNIX Concepts and Application By Sumitabha Das--- Tata McGraw-Hill publication 4.The C Odyssey UNIX the open boundless C By Meeta Gandhi--- BPB Publications

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Course Outcomes:

1. Differentiate between multiprocessing, multiprogramming, and multitasking.
2. Differentiate between programs, processes and threads.
3. Knowledge about working environment in UNIX.
4. Knowledge about the UNIX commands to perform different tasks.
5. Difference between DOS and UNIX environment.
6. Create or design different scripts using shell programming.
7. Implement process, thread, semaphore concept of operating system
8. Responsibilities and duties of a system administrator along with the knowledge how to grant permission to users, create user account etc.