

Subject Code : 1CS2010302	Subject Title: OPERATING SYSTEM
Pre-requisite :	Basic knowledge of Computer Software and Hardware Knowledge of programming language like C/C++, Data Structure.

Course Objective:

The objectives of the course are to:

- Understand of the modern operating system
- Understand the concept of process, concurrency, concept of deadlock, Memory Management and also learn distributed applications.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture	Tutorial	Practical	Credit	Theory		Practical		Total
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
3	-	3	6	60	40	30	20	150

Subject Contents			
Sr. No	Topic	Total Hours	Weight (%)
1	<p>Introduction : What is Operating System ?, Evolution of OS, Different Services of OS, Types of OS, Characteristics of Modern OS</p> <p>Process Management : Concepts of Process, Attributes of Process, Process Control Block, Data structures, Processes and Threads, Process State, Uni-Processor Scheduling: Scheduling, Types of Scheduling, Scheduling Algorithms.</p> <p>Inter Process Communication(IPC) : Need of IPC, Concurrency, Race conditions, Critical Section, Mutual Exclusion Problem, Solution Approaches, Algorithmic Approaches, Critical Region, Condition for Critical Region, Semaphore : Binary ,Counting, Monitors , Message Passing: Synchronous vs. Asynchronous Message Exchange.</p>	10	30
2	<p>Deadlock : Deadlock Problem, Deadlock Characterization, Dealing with Deadlock, Deadlock Detection, Deadlock Prevention, Deadlock Avoidance: Banker's Algorithm for Multiple Resources.</p> <p>Classical IPC Problems : Dinning Philosopher, Reader's & Writer Problem, Bounded Buffer Problem.</p>	8	20
3	<p>Memory Management : Memory Management Requirements, Memory Partitioning, Multiprogramming With Fixed partitions</p> <p>Paging: Principle Of Operation, Page Allocation, H/W Support For Paging, Segmentation, Swapping.</p> <p>Virtual Memory : Concept, Performance Of Demand Paging, Page Replacement Algorithms, Thrashing, Locality</p>	10	25
4	<p>Input/output and Files : I/O Management and Disk Scheduling: I/O Devices, Organization of the I/O Function, OS Design Issues, I/O Buffering, Disk Scheduling, RAID, Disk Cache.</p> <p>File Management : Overview, File Organization, File Directories, File Sharing, Record Blocking, Secondary Storage</p>	6	15

5	Distributed System : Distributed Processing, Client/Server and Clusters: Client/Server Computing, Distributed Message Passing, Remote Procedure Calls, and Clusters.	4	10
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Course Outcome:

At the end of this course, the student would be able

- To understand the Basic Concepts of Operating System and Architecture of Operating System.
- To study the process management and the concept of Deadlock and clear his/her knowledge With Memory Management techniques.
- To understand whole input/output management and distributed operating system architecture

List of references:

1. Stalling W, "Operating Systems", 7th edition, Prentice Hall India.
2. Silberschatz, A., Peter B. Galvin and Greg Gagne, "Operating System Principles", Wiley-Indian Edition, 8th Edition
3. Tanenbaum A.S., "Modern Operating Systems", 4th Edition, PHI.

List of Experiments:

Sr.No	Practical Exercise
1	Study basic commands of Linux/UNIX
2	Study advance commands of Linux/UNIX
3	Display : calendar of current month, today's date and time, usernames those are currently logged in the system, your name at given x, y position, your terminal number.
4	Write two different commands to display all hidden files in current working directory.
5	Display message " Date: <dd/mon/yyyy> and Time : <time>"
6	Write a command to display list of logged in users and store that list in file1.txt file.
7	Combine three files into one file using single command.
8	Write a command that lists all the files in the current directory that was created in Nov(Particular Month) and are .sh files.
9	Count all the subdirectories of Specified directories.
10	Delete first, last and the entire blank lines from the specified file.
11	Write a shell script to check entered string palindrome or not
12	Write a shell script to find factorial of given number n.
13	Write a shell script which will accept a number b and display first n prime numbers as output.
14	Write a shell script which will generate first n Fibonacci numbers like: 1, 1, 2, 3, 5, 13,...
15	Write a shell script to read n numbers as command arguments and sort them in descending order.
16	Create a shell script to accept a string in lower case letters from a user, & convert to upper case letters.
17	Create a shell script to reverse the digits of a given 5-digit number. (For eg. , if the no. is 57429 then answer is 92475).
18	Write shell script to manage(add/update/view/delete) Judge database with Fields: Judge Name, CourtName, City, Cases_judged, TotalCasses 1. Display No of records

	<ol style="list-style-type: none"> 2. Find Judge with highest cases judged 3. Calculate total Cases of Court "Ahmedabad" 4. List All Judge Names 5.Exit
19	<p>Write a Script for Simple LIBRARY Management System Operation. Database File Contains Following Fields : AccNo,Title, Author,Edition,Publisher</p> <ol style="list-style-type: none"> a. VIEW RECORD BASED ON QUERY b. ADD RECORD c. DELETE RECORD d. COUNT TOTAL NUMBER OF RECORDS e. EXIT
20	<p>Write a script for Simple Database Management System Operation. Database File Contains Following Fields : Branch,College, City,totalSeats,TotalAdmitted</p> <p>Provide Menu Driven Facility For:</p> <ol style="list-style-type: none"> 1. Display total seats available for given branch. 2. Display colleges for given City and Branch 3. Add record 4. Modify record 5. Exit