

CSE12156	Operating System Lab	L	T	P	C
Version 1.0	Contact Hours 30 Hours	0	0	2	1
Pre-requisite/Exposure	Data structures, Programming Languages, and Computer Architecture.				
Co-requisite	NIL				

Course Objectives:

- To introduce basic Unix commands, system call interface for process management, interprocess communication and I/O in Unix.
- To understand the students to study the basic principles and functionality of operating systems.
- To provide the students to identify the concepts of CPU scheduling, concurrent processes, deadlock
- To allow the students to identify the significance of memory management and virtual memory.
- To enhance the skill of students to identify the disk scheduling, file systems, and device management.
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Course Outcomes:

On the completion of this course the student will be able to

CO1: Understand and implement basic services and functionalities of the operating system using systemcalls and shell script.

CO2: Analyze and simulate CPU Scheduling Algorithms like FCFS, Round Robin, SJF, and Priority.

CO3: Assessing various solutions for critical Section problem. Applying deadlock avoidance principles and Check for the occurrence of deadlock.

CO4: Implement memory management schemes and page replacement schemes. **CO5:** Simulate file allocation and organization techniques.

Course Description:

The goal of this course is to have students understand and appreciate the principles in the design and implementation of operating systems software. The course will cover the concepts of operating systems, process management, memory management, file systems. Experiments on process scheduling and other operating system duties will be conducted through simulation/implementation in the laboratory.

Course Content:

Units	Lecture Hours
Unit-I: Linux Commands/Shell Programming: study about the basics of Linux commands. Implementation of shell scripting using conditional/branching statement. Implementation of shell scripting using Loop statement. Implementation of shell scripting using Array. Implementation of shell scripting using String. Implementation of shell scripting using Function and recursion.	09
Unit-II: Process Scheduling Algorithm: Simulate the following non-preemptive CPU scheduling algorithms to find turnaround time and waiting time. S b) SJF c) Priority Simulate the following non-preemptive CPU scheduling algorithms to find turnaround time and waiting time. rtest Remaining Time First b) Round Robin c) Priority Simulate multi-level queue scheduling algorithm considering the following scenario. All the processes in the system are divided into two categories system processes and user processes. System processes are to be given higher priority than user processes. Use FCFS scheduling for the processes in each queue.	09
Unit-III: Process Synchronization Problems /Deadlock: Implement producer-consumer problem using semaphores. Implement the concept of Dining-Philosophers problem. Implement Bankers algorithm for the purpose of deadlock avoidance.	09
Unit-IV: Memory Management Techniques: Implement page replacement algorithms O b) LRU c) Optimal Implement disk scheduling algorithms S b) SCAN c) C-SCAN Simulate selection partition algorithm a). Best Fit b). First Fit c). Worst Fit	09
Unit-V	09

Examination Scheme:

Components	Mid Term	Class Assessment	End Term
Weightage (%)	20	30	50

Relationship between Course Outcomes (COs) and Program Outcomes (POs):

1 = Weakly Mapped 2 = Moderately Mapped 3 = Strongly Mapped

[illegible]

Course Code	Course Name	COs	P O1	P O2	P O3	P O4	P O5	P O6	P O7	P O8	P O9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
		CO1215	1	2	3	3	2	3	3	-	3	-	-	3	1	1	1
		6.4															
		CO1215	2	3	2	1	3	2	2	-	1	-	-	1	1	3	1
		6.5															
		CO1215	2.	2.	2.	1.	1.	2.	1.	-	2.	-	-	2.2	1.4	2.0	1.0
		6	4	2	4	8	8	4	8		2						