

BCSE303P	Operating Systems Lab		L	T	P	C
			0	0	2	1
Pre-requisite	Nil	Syllabus version				
		1.0				
Course Objectives						
1. To introduce the operating system concepts, designs and provide skills required to implement the services.						
2. To describe the trade-offs between conflicting objectives in large scale system design.						
3. To develop the knowledge for application of the various design issues and services.						
Course Outcome						
On completion of this course, student should be able to:						
1. Interpret the evolution of OS functionality, structures, layers and apply various types of system calls of various process states.						
2. Design scheduling algorithms to compute and compare various scheduling criteria.						
3. Apply and analyze communication between inter process and synchronization techniques.						
4. Implement page replacement algorithms, memory management problems and segmentation.						
Differentiate the file systems for applying different allocation, access technique, representing virtualization and providing protection and security to OS.						
Indicative Experiments						
1.	Study of Basic Linux Commands					
2.	Implement your own bootloader program that helps a computer to boot an OS.					
3.	Shell Programming (I/O, Decision making, Looping, Multi-level branching)					
4.	Creating child process using fork () system call, Orphan and Zombie process creation					
5.	Simulation of CPU scheduling algorithms (FCFS, SJF, Priority and Round Robin)					
6.	Implement process synchronization using semaphores / monitors.					
7.	Simulation of Banker s algorithm to check whether the given system is in safe state or not. Also check whether addition resource requested can be granted immediately					
8.	Parallel Thread management using Pthreads library. Implement a data parallelism using multi-threading					
9.	Dynamic memory allocation algorithms - First-fit, Best-fit, Worst-fit algorithms					
10.	Page Replacement Algorithms FIFO, LRU and Optimal					
11.	Implement a file locking mechanism.					
12.	Virtualization Setup: Type-1, Type-2 Hypervisor (Detailed Study Report)					
Total Laboratory Hours					30 hours	
Text Book						
1.	Fox, Richard, “Linux with Operating System Concepts”, 2022, 2 nd Edition, Chapman and Hall/CRC, UK.					
Reference Books						
1.	Love, Robert, "Linux System Programming: talking directly to the kernel and C library", 2013, 2 nd Edition, O'Reilly Media, Inc, United States.					
2.	Abraham Silberschatz, Peter B. Galvin, Greg Gagne, “Operating System Concepts”, 2018, 10 th Edition, Wiley, United States.					
Mode of Assessment: Continuous Assessments, FAT						
Recommended by Board of Studies			04-03-2022			
Approved by Academic Council			No. 65	Date	17-03-2022	