Techno College of Engineering Agartala

An Engineering College Approved by AICTE, MHRD, Govt. of India

Affiliated to Tripura University (A Central University),

Department of Computer Science & Engineering

List of Laboratory Experiments

Operating Systems Lab						
Course Code	**Hours / Week**				**Maximum Marks**	
PC CS 408	L	T	P	C	CIA	SEE	Total
	0	0	2	1	40	60	100

Number of classes: 24 Hours	Prerequisites: Computer Basics
Branch: CSE	Semester: IV

Course overview:

The Operating Systems Lab provides hands-on experience in implementing core concepts of operating systems such as process management, memory management, file systems, and scheduling algorithms. Students will develop programs simulating CPU scheduling, synchronization techniques, deadlock handling, and memory allocation methods. The lab enhances students' understanding of system-level operations and reinforces theoretical concepts through practical implementation using C/C++ or shell scripting in Linux environments, preparing them for system programming and advanced OS topics.

Course objectives:

   i.   To understand the practical implementation of fundamental operating system concepts such as process scheduling, synchronization, and memory management.
   ii.   To develop skills in writing programs related to CPU scheduling, file systems, and system calls.
   iii. To simulate classical problems like producer-consumer, dining philosophers, and demonstrate solutions using semaphores and monitors.
   iv.   To familiarize students with Linux/Unix system programming using C and shell scripting.
   v.   To analyze and compare different OS algorithms based on performance metrics.

Course outcomes:

CO Number	CO Description	K-level
CO-1	Implement deadlock avoidance, and Detection Algorithms	K-3
CO-2	Compare the performance of various CPU scheduling Algorithm	K-4
CO-3	Analyze the performance of the various page replacement algorithms	K-4
CO-4	Create processes and implement IPC	K-3
CO-5	Implement C programs using Unix system calls	K4
Sl. No.	**EXPERIMENT NAME**	**CO**
1.	Basics of UNIX commands.	CO-1

2.	Shell Programming- creating a bash shell script, making a script executable, shell syntax (variables, conditions, control structures, functions, commands)	CO-1
3.	Password security, Shadow file, Groups and the group file, Shells, restricted shells, user management commands, homes and permissions, default files, profiles, locking accounts, setting passwords, Switching user, Switching group, Removing users &user groups.	CO-2
4.	Implement the following CPU scheduling algorithms a) Round Robin b) SJF c) FCFS d) Priority	CO-2
5.	Implement all file allocation strategies a) Sequential b) Indexed c) Linked	CO-2
6.	Implement Inter-process communication- pipes (use functions pipe, popen, pclose), named pipes(FIFOs, accessing FIFO), message passing & shared memory (IPC version V).	CO-2
7.	Implement Semaphores	CO-4
8.	Implement all File Organization Techniques: a) Single level directory b) Two level c) Hierarchical d) DAG	CO-4
9.	Implement Bankers Algorithm for Dead Lock Avoidance	CO-3
10.	Implement an Algorithm for Dead Lock Detection	CO-3
11.	Implement e all page replacement algorithms a) FIFO b) LRU c) LFU	CO-4
12.	Implement Shared memory and IPC	CO-4
13.	Implement Paging Technique of memory management.	CO-5
14.	Implement Threading & Synchronization Applications	CO-5
15.	Implement disk management algorithms-FCFS, SSTF, SCAN, C-SCAN	CO-5