OPERATING SYSTEMS LAB SYLLABUS

Module 1: Shell Programming

- Basics: I/O, Decision Making, Looping, Multi-level Branching

Module 2: Basic Linux Commands

- Study and Practice: Essential Linux commands for system administration and file management

Module 3: Bootloader Program

- Implementation: Develop a bootloader program that initializes hardware and boots an OS

Module 4: Process Management

- Creating Child Processes: Using `fork()` system call
- Process States: Orphan and Zombie Processes
- Simulation: CPU Scheduling Algorithms (FCFS, SJF, Priority, Round Robin)

Module 5: Process Synchronization

- Implementation: Synchronization using Semaphores and Monitors

Module 6: Banker's Algorithm

- Simulation: Check system's safe state and immediate resource requests

Module 7: Thread Management

- Parallel Thread Management: Using Pthreads library
- Data Parallelism: Implementing multi-threading

Module 8: Memory Allocation

- Algorithms: First-fit, Best-fit, Worst-fit

Module 9: Page Replacement Algorithms

- Implementation: FIFO, LRU, Optimal

Module 10: File Locking Mechanism

- Implementation: Develop a file locking mechanism for concurrent file access

Module 11: Virtualization Setup

- Types: Type-1 and Type-2 Hypervisors
- Detailed Study Report: Comparative analysis and implementation guide