DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

**NITK-Surathkal**

**Course Plan and Evaluation Plan**

**IV Sem B.Tech**

1. **Course code** : CO254
2. **Course Title** : Operating Systems Lab
3. **L-T-P** : [0-0-3]
4. **Credits** : 2
5. **Course Instructors** : Dr. Shashidhar G. Koolagudi (S1)

Ms.Rashmi Adyapady R. (S2)

1. **Teaching Department** : Computer Science & Engineering
2. **Objective of the Course:**

This lab complements the Operating System Course. Students will gain practical experience with designing and implementing concepts of operating systems such as system calls, CPU scheduling, process management, memory management, file systems and deadlock handling using C language in Linux environment

1. **Weekly Plan (Each experiment has to be implemented and shown to the instructor during respective week)**

**Assume necessary details required during implementation.**

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|  |  | **Experiment 1 (Week-1)** |
| 1.  2. | i)  ii)  i)  ii)  iii) | Analyze and execute different types of system calls  **File structure related system calls**  creat(), open(), close(), read(), write(), lseek(), dup(), link(), unlink(), access(), chmod(), chown(), unmask(), ioctl()  **Process related system calls**  execl(), fork(), wait(), exit(), getuid(), geteuid(), getgid(), getegid(), getpid(), getppid(), signal(), kill(), alarm(), chdir()  Differentiate between Linux and/or other O.S (Windows)  Security issues between Linux and/or other O.S (Windows)  Scheduling Algorithms used between Linux and/or other O.S (Windows) |
|  |  | **Experiment 2 (Week-2)** |
|  |  | **Objective**:  Write a Socket Program in C that illustrates the client-server architecture for TCP and UDP. |
|  |  | **Experiment 3 (Week-3)** |
|  | **i)**  **ii)**  **iii)**  **iv)** | **Objective:**  Write a C program to simulate the following non-preemptive CPU scheduling algorithms to find turnaround time and waiting time for the above problem. Assume all the processes arrive at the same time.  FCFS  SJF  Round Robin (pre-emptive)  Priority |
|  |  | **Experiment 4 (Week-4)** |
|  | **i)**  **ii)**  **iii)** | **Objective:**  Write a C program to simulate  Producer-Consumer problem using semaphores.  Readers-Writers problem  Dinning-Philosophers problem |
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|  |  | **Experiment 5 (Week-5)** |
|  |  | **Objective:**  Write a C program to simulate Banker’s algorithm for the purpose of deadlock avoidance. |
|  |  | **Experiment 6 (Week-6)** |
|  |  | **Objective:**  Write a C program to simulate the MVT and MFT memory management techniques. |
|  |  | **Experiment 7 (Week-7)** |
|  | **i)**  **ii)**  **iii)** | **Objective:**  Write a C program to simulate the following contiguous memory allocation techniques  Worst-fit  Best-fit  First-fit |
|  |  | **Experiment 8 (Week-8)** |
|  | **i)**  **ii)**  **iii)** | **Objective:**  Write a C program to simulate page replacement algorithms  FIFO  Optimal  LRU |
|  |  |  |
|  | **i)**  **ii)**  **iii)** | **Experiment 9 (Week-9)**  **Objective:**  Write a C program to simulate disk scheduling algorithms  FCFS  LOOK  C-SCAN |
|  |  | **Mini Project:** |
|  |  | Design an OS Simulator which simulates all the above mentioned experiments. |

1. **Evaluation Plan:**

Surprise test 20% (one before mid-sem and one before mid-sem)

Midsem. 20%

Endsem (Mini Project) 40%

Lab assignments+ report 20%

**Course Instructor(s) HOD**

**(Shashidhar G. Koolagudi) (S1)**

**(Rashmi Adyapady R.) (S2)**