

**National institute of Technology Karnataka,
Surathkal Department of Computer Science and
Engineering**

CoursePlan (Part-A)

Name of the course: Operating System Lab	Course Code: : CS255	No. of Credits (L-T-P): 2(0-0-3)
Year: II Year; Semester: IV; Section: S1	Course Type: Program Core (PC)	Academic Session: Even, 2024

A.Prerequisites (if any): None

B. Name and Contact Details of the Course Instructor: Dr.Radhika B S, Email:
radhikabs@nitk.edu.in , Ms.Deepthi , Email: al.deepthi.cs@nitk.edu.in ,
 Ms.Nishmitha , Email: al.nishmitha.cs@nitk.edu.in

C.Assessment Pattern (Use Bloom's taxonomy to design rubrics for evaluating student's performance):

Level No.	Knowledge Level	Evaluation Component				Assessment (%)
		Mid Sem 25%	Mini project 25%	Regular Lab evaluation 20%	End Sem 30%	
K1	Remember	10%	10%	05%	05%	07%
K2	Understand	20%	25%	30%	20%	25%
K3	Apply	20%	25%	20%	20%	21%
K4	Analyse	20%	20%	20%	20%	20%
K5	Evaluate	15%	15%	20%	15%	17%
K6	Create	15%	05%	05%	20%	10%
Total						100%

D. Assessment Process:

Evaluation Component	Assessment Frequency	Assessed by	Reviewed by
Mid Sem [25%]	Once in the semester	Course instructor	Course instructor
Mini project [25%]	Twice in the semester	Course instructor	Course instructor
Regular Lab evaluation [20%]	Throughout the semester	Course instructor	Course instructor
End Sem [30%]	Once in the semester	Course instructor	DUGC

E. Course Objectives:

Sl. No.	Course Objectives
1	To Analyze and execute different types of system calls
2	To Analyze and implement CPU scheduling algorithms
3	To understand and study processing synchronization and deadlock
4	Simulate the memory management techniques
5.	To simulate the following contiguous memory allocation techniques
6.	To learn and understand the page replacement algorithm and memory management with the implementation of page table.
7.	To understand the concepts of file allocation strategies
8.	To understand the operating system merging of all experiments in simulator

F. Course (Learning) Outcomes (COs):

Cos	Course Outcomes
1	Students will understand the types of operating system and ability to create threads and perform Inter process communication
2	Students can understand CPU scheduling and able to solve process synchronization problems.
3	Students can understand the issues surrounding deadlock handling and memory management.
4	Students can gather the knowledge about paging and segmentation methods suitable for virtual memory. Ability to manage files and directory.
5.	Students will be able to understand the recovery and manage disk spaces. Knowledge of files systems and Android OS
6.	Students can simulate the working of operating system, also algorithm used in operating system and develop dummy operating system

G. Course Articulation Matrix:

(**Note:** Enter correlation levels 1, 2, or 3 as defined below: 1 - Slight (Low), 2 - Moderate (Medium) 3 - Substantial (High), and If there is no correlation, put “-”)

COs	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
1	1	1	1	1	1	1	2	1	2	2	3	3	3	2
2	3	3	2	2	2	1	3	-	3	2	3	3	3	3
3	2	3	3	3	2	1	3	-	3	3	3	3	3	3
4	3	3	3	2	2	2	2	-	3	3	3	3	3	3
5	2	1	1	1	1	1	3	-	3	1	2	3	3	3
Avg.	2.2	2.2	2	1.8	1.6	1.2	2.6	0.2	2.8	2.2	2.8	3	3	2.8

H. Program Articulation Matrix:

(**Note:** Enter correlation levels 1, 2, or 3 as defined below: 1 - Slight (Low), 2 - Moderate (Medium) 3 - Substantial (High), and If there is no correlation, put “-”)

PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
2	2	2	2	2	1	2	0	3	2	3	3	3	3

I. Course Syllabus:

Module	Topic to be covered	No. of hrs	Date of evaluation
1	Analyze and execute different types of system calls	1 Week	28-01-2025
2	Write a program to simulate the following non-preemptive CPU scheduling algorithms to find turnaround time and waiting time for the below problem. i. FCFS ii. SJF iii. Round Robin (pre-emptive) iv. Priority	1 Week	04-02-2025
3	Write a program to simulate Producer-Consumer problem using semaphores, Readers-Writers problem, Dining-Philosophers problem	1 Week	10-02-2025
4	Write a program to simulate Banker's algorithm for the purpose of deadlock avoidance. Write a program to implement an algorithm for deadlock detection.	1 Week	11-02-2024
5	Write a program to simulate the MVT and MFT memory management techniques	1 Week	04-03-2025
6	Write a program to simulate the following contiguous memory allocation techniques i. Worst-fit ii. Best-fit iii. First-fit iv) Next-fit	1 week	11-03-2025
7	Write a program to simulate page replacement algorithms i. FIFO ii. Optimal iii. LRU iv. LFU	1 week	18-03-2025
8	Write a program to simulate disk scheduling algorithms i. FCFS ii. SCAN iii. SSTF	1 week	25-03-2025
9	Write a program to simulate the following file allocation strategies i. Sequential ii. Indexed iii. Linked	1 week	01-04-2025
10	Write a program to simulate Single level directory file organization technique.	1 week	08-04-2025

J. List of Textbooks & Reference books, Online Course Resources:

Items	Sl. No.	Title, Author, Publisher etc.
Textbooks	1	Silberschatz, Galvin & Gagne, Operating System Concepts, 9th Edition, John Wiley & Sons, 2013
	2	Melin Milenkovic, Operating Systems: Concepts and Design, McGraw Hill, New York, 2000.
	3	Sumitabha Das, Unix Concept and applications
Reference books	1	Operating system and middleware supporting control interaction by Max Hailperin
	2	Modern operating system by Andrew S. Tanenbaum; (and Herbert Bos for 4th edition) 4th Edition March 20, 2014
	3	Mukesh Singhal and Niranjana G. Shivaratri, “Advanced Concepts in Operating Systems – Distributed, Database, and Multiprocessor Operating Systems”, Tata McGraw-Hill, 2001.
Online Resources	1	NPTEL Courses (https://nptel.ac.in/courses/106/105/106105214/):
	2	● https://www.geeksforgeeks.org/operating-systems/
	3	● http://www.scs.stanford.edu/17wi-cs140/

Name and signature of course instructor with date:

Name and signature of DUGC/DPGC Secretary with date:

Name and signature of DUGC/DPGC Chairman with date:

Name and signature of HOD with date: