

KU4DSCCSC210: Operating Systems

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
4	DSC	200-299	KU4DSCCSC211	4	60

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	-	30	70	100	2 Hrs

Course Description:

An operating system is the most important software that runs on a computer. It manages the computer's memory and processes, as well as all of its software and hardware. It also allows you to communicate with the computer without knowing how to speak the computer's language.

Course Prerequisite: NIL**Course Outcomes:**

CO No.	Expected Outcome	Learning Domains
1	Outline various concepts and features of Operating systems.	U
2	Compare various operating systems with respect to characteristics and features	U
3	Identify algorithm of CPU Scheduling, Memory Scheduling and disk scheduling.	U, A
4	Explain Linux operating system commands	U, A

**Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)*

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	3			2			
CO 2							
CO 3	3		2				
CO 4	3		2				3

COURSE CONTENTS

Contents for Classroom Transaction:

M O D U L E	U N I T	DESCRIPTION	HOURS
1		MODULE1: Introduction to OS	
	1	Introduction, structure of Operating Systems, Different types of Operating systems-Batch Processing System, Multi programming system, Time Sharing System, Real Time System, Distributed system	12
	2	Functions of operating system-Process management, Main memory management, File management, I/O system management, Secondary storage management	
	3	User mode and Kernel mode, System Calls (Introduction only), Operating System Design and Implementation approaches	
	4	Operating System Design and Implementation approaches, Operating System Structures - simple, layered, micro Kernel	
2		MODULE 2: Process Management	
	1	Processes: Process Concept–The Process, Process State , Process Control Block	12
	2	Process Scheduling–Schedulers, Context Switch-CPU Scheduling: Basic Concepts–CPU scheduler	
	3	Pre-emptive and non pre-emptive scheduling, Dispatcher-Scheduling criteria	
	4	Scheduling algorithms–FCFS, SJFS, Priority Scheduling, Round Robin	
		Scheduling	
3		MODULE 3: Deadlock, Memory Management and Disk Scheduling	12

1	Deadlocks: Characterization – necessary conditions – Resource allocation graph – - Deadlock prevention – mutual exclusion, hold and wait, no pre-emption, circular wait
2	Memory: Contiguous Memory Allocation, Segmentation, Paging, Demand Paging
3	Page Replacement - Basics, FIFO Page Replacement, Optimal Page Replacement, LRU Page Replacement
4	Mass Storage Structure: Disk Structure-Disk Scheduling: FCFS Scheduling, SSTF Scheduling, SCAN Scheduling, C-SCAN Scheduling, LOOK Scheduling, C-LOOK Scheduling

4	MODULE 4: Introduction to Linux and basic commands	
1	History of Unix and Linux, Linux Overview, Processes in Linux	12
2	Memory management in Linux, I/O in Linux, Linux file system, security in Linux	
3	Linux commands: pwd, cd, absolute and relative paths, ls, mkdir, rmdir, , chmod nice- Package Management)- apt update apt upgrade apt update apt upgrade apt install package apt remove package	
4	vi editor, security by file permissions	

5	Teacher Specific Module	
	<i>Directions</i>	
	Installation of OS Practice various linux commands in lab	12

Essential Readings:

1. "Operating System Concepts" by Abraham Silberschatz, Peter B. Galvin, and Greg Gagne.
2. "Modern Operating Systems" by Andrew S. Tanenbaum.
3. "Operating Systems: Internals and Design Principles" by William Stallings.
4. "The Linux Programming Interface: A Linux and UNIX System Programming Handbook" by Michael Kerrisk.

Suggested Readings:

1. <https://www.geeksforgeeks.org/cpu-scheduling-criteria/>
2. <https://www.geeksforgeeks.org/conditions-for-deadlock-inoperating-system/?ref=lbp>
3. Linux System Programming, Robert Love, O'Reilly, SPD
4. Dhananjay M. Dhamdhere, Operating Systems A Concept Based Approach, 3rd Ed, TMH

Assessment Rubrics:

Evaluation Type		Marks	Evaluation Type		Marks	Total
Lecture		70	Practical		0	100
a)	ESE	70	a)	ESE	0	
b)	CCA	30	b)	CCA	0	

V SEMESTER