MCA SEMESTER – II

SUBJECT : OPERATING SYSTEM AND LINUX PROGRAMMING

Teaching Scheme (Hours/Week)				Credits	Examination Scheme				
Lect	Tut	Prac	Total		Ext	Sess.	TW	Prac	Total
4	-	2	6	5	60	40	25	25	150

A. COURSE OVERVIEW

This course explains building blocks of operating system such as process management, memory management, deadlock management and disk scheduling. The course covers usage of system calls for process, file and memory management. It illustrates basics of file handling commands and shell scripts.

B. COURSE CONTENT

NO	TOPIC	L+T (hrs)	COs
[1]	Basic Elements, Processor Registers, Instruction Execution, Interrupts, Memory Hierarchy, Cache Memory Operating System: Introduction, Objectives, Functions, Evolution, Major Achievements, Characteristics of Modern Operating System.	8	CO1
[2]	Process Concept, Process States, Process Control, System Calls for Process Management (fork, wait), Process Scheduling: Types and Algorithms, Introduction to Threads Principles of Concurrency, Semaphores, Monitors, Reader/Writer Problem Deadlock: Introduction, Principles of Deadlock, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection.	18	CO2 CO3 CO4
[3]	Memory Management Requirements, Memory Partitioning, Paging, Segmentation, System Calls for Memory Management(shmget, shmat, shmdt, shmctl), Hardware and Control Structures, Virtual Memory, Operating System Software.	15	CO2 CO4
[4]	Overview, Disk Scheduling, Redundant Array of Independent Disks File Management Overview, File Organization and Access, System Calls for File Management (open, close, read, write, lseek).	10	CO2 CO4
[5]	Basic commands: who, whoami , man, ps ,pwd,echo Directory Handling Command: cd ,mkdir,rmdir File Handling Command: cat,cp,mv,rm,wc Shell Script: read Command, Command Line Arguments, if, case, expr (artithmetic operation), while Loop, for Loop.	9	CO5

C. TEXT BOOKS

1. William Stalling, *Operating Systems: Internals and Design Principles;* 6th ed.; Prentice Hall India
2. Sumitabha Das, *UNIX- Concepts and applications*; 4th ed.; TMH Publication

D. REFERENCE BOOKS

1. Abraham Silberschatz, Peter B. Galvin and Greg Gagne, *Operating System Principles;* 9th ed.; Wiley-Indian
2. A. S. Tanenbaum, *Modern Operating Systems;* 4th ed.; PHI
3. Yashvant P. Kanetkar , *Unix Shell Programming*; BPB publication

E. COURSE OUTCOMES

CO Number	Skill	Statement
CO1	Understand	Express significance of the operating system and its various building blocks.
CO2	Analyze	Contrast various algorithms for process scheduling, memory management and disk scheduling.
CO3	Apply	Justify the importance of concurrency control and deadlock management.
CO4	Apply	Experiment basic management of processes, files and memory using Linux system calls.
CO5	Apply	Implement various shell scripts for file management, user management and privilege management.

F. COURSE MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1
CO1	3	-	-	-	-	-	2	-	-	-	1	-	2
CO2	2	3	3	2	-	-	3	-	-	-	2	-	2
CO3	3	3	1	2	-	-	2	-	-	-	1	-	2
CO4	2	3	3	3	-	-	2	-	-	-	3	-	2
CO5	1	2	3	3	-	-	1	-	-	-	3	-	2
Avg	2.2	2.2	2	2	-	-	2	-	-	-	2	-	2