	CS-24: Operating Systems Concepts with Unix / Linux	
Objectives:		
	• To provide the basic feature, function and interface with the hardware and application software to run the computer smoothly.	
Prerequisites:		
	• Basic knowledge of operating system and it's functionality along with its types	

Unit No.	Topic	Detail
1	**Introduction, Process and Thread, Process Scheduling**	• Meaning of OS • Functions of OS • Features of OS • OS Types (User Point of View) • OS Types (Features Point of View)

		• Process Definition
		• Process States
		• Process State Transitions
		• Process Control Block
		• Context Switching
		• Threads
		   o Concept of multithreads
		   o Benefits of threads
		   o Types of threads

		• Types of Schedulers • CPU Scheduling Algorithms • FCFS • SJN • Round Robin • Priority Base Non-Preemptive • Priority Base Preemptive
2	**Deadlocks, Memory Management**	• Deadlocks: Definition • Deadlock Prevention • Deadlock Avoidance • Deadlock Detection • Physical Memory and Virtual Memory • Memory Allocation • Internal and External fragmentation • Contiguous Memory Allocation • Noncontiguous Memory Allocation • Virtual Memory Using Paging • Virtual Memory Using Segmentation

3	**Getting Started with Unix, Unix Shell Command**	- Unix Architecture - Unix Features - Types Of Shell (C, Bourn, Korn) - Unix File System - Types Of Files - Ordinary Files - Directory Files - Device Files - Unix File & Directory Permissions
		- Connecting Unix Shell : Telnet - Login Commands passwd, logout, who, who am i, clear,uname - File / Directory Related Command ls, cat, cd, pwd, mv, cp, ln, rm, rmdir, mkdir, chmod, chown, chgrp, find, more, less, head, tail, wc, touch, stat, alias, type - Operators in Redirection & Piping <, >, <<, >>, | - Finding Patterns in Files grep, fgrep, egrep - Working with columns and fields cut, paste, join - Tools for sorting :sort, uniq - Comparing files : cmp, comm, diff - Changing Information in Files: tr, sed - Examining File Contents : od - Tools for mathematical calculations: bc, factor - Monitoring Input and Output :tee, script - Tools For Displaying Date and Time: cal, date - Communications : telnet, ping - Process Related Commands: ps, sleep
4	**Text Editing with vi and nano Editor, Shell Programming**	- Introduction of vi editor - Modes in vi - Switching mode in vi - Cursor movement - Screen control commands - Entering text, cut, copy, paste in vi editor - Introduction of nano editor
		- Shell Keywords - Shell Variables - System variables PS2, PATH, HOME,LOGNAME, MAIL, IFS, SHELL, TERM, MAILCHECK

		• User variables
		    set, unset and echo command with shell variables
		• Positional Parameters
		• Interactive shell script using read and echo
		• Decision Statements
		    o if then fi
		    o if then else fi
		    o if then elif else fi
		    o case esac
		• test command
		• Logical Operators
		• Looping statements
		    o for loop
		    o while loop
		    o until loop
		    o break, continue command
		• Array
		• Function
		• Various shell script examples

5	**Getting Started with Linux, Linux Booting, Linux Admin (Ubuntu)**	• History of Linux • GNU, GPL Concept • Open Source & Freeware • Structure and Features of Linux • Installation and Configuration of Linux o Using with Ubuntu • Startup, Shutdown and boot loaders of Linux

		• Linux Booting Process
		    o LILO Configuration
		    o GRUB Configuration

		• Creating Linux User Account and Password • Installing and Managing Samba Server • Installing and Managing Apache Server • Configure Ubuntu's Built-In Firewall • Working with WINE

Seminar   -   5 Lectures
Expert Talk   -   5 Lectures
Test   -   5 Lectures

Total Lectures 60 + 15 = 75

Reference Books:
- Operating System Concept, Abraham Silberschatz, Peter B. Galvineg Gagne, Wiley-Indian Edition, 9th Edition

- Operating Systems, Internals and Design Principles, William Stallings, Seventh Edition
- Unix Shell Programming – Y. Kanetkar – Bpb Publications
- Unix Concepts and Applications – Sumitabha Das
- The complete reference Linux, Richard Petersen, McGraw Hill, Sixth Edition

Course outcomes:
- Understand design and implementation aspects of modern operating system
- Acquire knowledge of four major OS components: process management, memory management, file systems, and input/output mechanisms
- Analyze and compare various process scheduling algorithms
- Learn the concepts, design, and structure of the UNIX operating system
- Design shell scripts using various UNIX utilities

Hands-On (Not to be asked in the examination):
- Installation of Unix / Linux
- User and Group Creation
- Demo of Various Applications available in Unix / Linux like Star Office, Games and other productivity tools
- Demo of GNOME, KDE Desktops in Linux