DCS-1-02T: Operating Systems

Total Marks: 100
External Marks: 70
Internal Marks: 30
Credits: 6
Pass Percentage: 40%

Course: Operating Systems	
Course Code: DCS-1-02T	
Course Outcomes (COs) After the completion of this course, the students will be able to:	
CO1	Understand the structure of computing systems, from the hardware level through the operating system level and onto the applications level.
CO2	Understand basics of operating system viz. system programs, system calls, user mode and kernel mode.
CO3	Learn the working with CPU scheduling algorithms for specific situation, and analyze the environment leading to deadlock and its rectification.
CO4	Explore the memory management techniques viz. caching, paging, segmentation, virtual memory, and thrashing.
CO5	Apply Methods for Handling Deadlocks, Deadlock Prevention, and Recovery from Deadlock.

Detailed Contents:

Module	**Module Name**	**Module Contents**
Module 1	**Introduction and System Structures**	Computer-System Organization, Computer-System Architecture, Operating-System Structure, Operating-System Operations, Process Management, Memory Management, Storage Management, Protection and Security, Computing Environments, Operating-System Services, User and Operating-System Interface, System Calls, Types of System Calls, System Programs.
Module II	**Process Management**	Process Concept, Process Scheduling, Operations on Processes, Multi-threaded programming: Multithreading Models, Process Scheduling: Basic Concepts, Scheduling Criteria, and Scheduling Algorithms.
Module III	**Deadlock**	Deadlock: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from

		Deadlock.
Module IV	**Memory Management**	Basic Hardware, Address Binding, Logical and Physical Address, Dynamic linking and loading, Swapping, Contiguous Memory Allocation, Segmentation, Paging, Demand Paging, Page Replacement algorithms.
Module V	**File Systems**	File Systems: File Concept, Access Methods, Directory and Disk Structure, File-System Structure, File-System Implementation, Directory Implementation, Allocation Methods, Free-Space Management.
Module VI	**Introduction to Linux and Linux Commands**	Linux's shell, Kernel, Features of Linux, File System: Filenames, Introduction to different types of directories: Parent, Subdirectory, Home directory; rules to name a directory, Important directories in Linux File System, Linux Commands: cal, date, echo, bc, who, cd, mkdir, rmdir, ls, cat cp, rm, mv, more, gzip, tar, File ownership, file permissions, chmod, Directory permission, change file ownership.

Books

1. A Silberschatz, P.B. Galvin, G. Gagne, "Operating Systems Concepts", 8th Ed., John Wiley Publications, 2009
2. A.S. Tanenbaum, "Modern Operating Systems", 3rd Ed., Pearson Education, 2014
3. G. Nutt, "Operating Systems: A Modern Perspective", 2nd Ed., Pearson Education, 2000
4. S. Das, "Unix Concepts and Applications", 4th Ed., McGraw Hill Education, 2017