GENERAL AWARENESS COURSE IV: 4A14CSC OPERATING SYSTEMS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
4	4A14CSC	3	3	3

COURSE OUTCOME

CO1: Familiarize with basics of design of operating systems.
CO2: Introduce basic working process of operating systems.
CO3: To understand the importance process and scheduling.
CO4: To understand the issues in memory management.

Unit I: Introduction

Functions of an operating system, Kernel Data Structures, Operating Systems in different Computing Environments, Operating System Services, Operating System Interfaces, System Calls (Introduction only), Operating System Design and Implementation approaches, Operating System Structures - simple, layered, micro kernel, modules, System Boot.

(13 Hrs)

Unit II: Process Management

Process Concept- The Process, Process State, Process Control Block Process Scheduling – Scheduling Queues, Schedulers, Context Switch - CPU Scheduling: Basic Concepts – CPU scheduler, Pre-emptive scheduling, Dispatcher - Scheduling Criteria – Scheduling Algorithms - FCFS, SJFS, Priority Scheduling, Round Robin Scheduling.

(14 Hrs)

Unit III: Deadlock

Dead locks: Characterization – necessary conditions – Resource allocation graph – Methods for handling deadlock - Deadlock prevention – mutual exclusion, hold and wait, no preemption, circular wait – Deadlock avoidance – safe state, Resource allocation graph, Banker's algorithm, Safety algorithm, Resource request algorithm – Deadlock detection – single instance of each resource type, several instances of a resource type - recovery from dead lock – process termination, resource preemption.

(15 Hrs)

Unit IV: Memory Management

Main Memory: Swapping, Contiguous Memory Allocation, Segmentation, Paging, Virtual Memory: Demand Paging, Copy-on-Write, Page Replacement - Basic, FIFO Page Replacement, Optimal Page Replacement, LRU Page Replacement

Mass Storage Structure: Disk Structure-Disk Scheduling: FCFS Scheduling, SSTF Scheduling, SCAN Scheduling-SCAN Scheduling, LOOK Scheduling - Selection of a Disk Scheduling Algorithm

(12 Hrs)

Books for Study:

1. Abraham Silberschatz, Peter B Galvin, Greg Gagne, Operating System Concepts, 9/e, Wiley India, 2015.

Books for Reference:

1. Garry Nutt, Operating Systems: 3/e, Pearson Education, 2004
2. Dhananjay M. Dhamdhere, Operating Systems A Concept Based Approach, 3rd Ed, TMH
3. William Stallings, Operating Systems: Internals and Design Principles, Pearson, Global Edition, 2015.
4. Andrew S Tanenbaum, Herbert Bos, Modern Operating Systems, Pearson, 4/e, 2015.
5. Madnick S. and J. Donovan, Operating Systems, McGraw Hill, 2001.
6. Deitel H. M., An Introduction to Operating System Principles, Addison-Wesley, 1990.

Marks including choice:

Unit	Marks
I	14
II	16
III	16
IV	14