

OPERATING SYSTEMS

Course code: 18IS4DCOPS

L: P: T: S: 3: 0: 0: 0

Exam Hours: 03

Total Hours: 40

Credits: 03

CIE Marks: 50

SEE Marks: 50

Course Objectives:

1. Understand the structure and services of the operating system that provides to users and system.
2. Know the various CPU scheduling algorithms and multithreading concepts
3. Identify methods for handling deadlocks and recognize the classic synchronization problems
4. To gain knowledge on the various memory management techniques and file systems with

their storage structure

Course Outcomes: After completion of the course, the graduates will be able to

CO1	Describe types, features and design considerations of operating systems
CO2	Analyze and Apply the various process scheduling algorithms.
CO3	Solve appropriate deadlock handling method, synchronization methods
CO4	Analyze memory management techniques and choose the suitable algorithm.
CO5	Apply suitable techniques for management of different resources.
CO6	Describe the design considerations of file system and compare various disk scheduling algorithms.

Mapping of Course outcomes to Program outcomes:

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	PS01	PS02	PS03
CO1	2	2	-	-	-	-	-	-	-	-	-	2	1	-	-
CO2	3	2	2	-	-	-	-	-	-	-	-	-	2	-	-
CO3	3	2	2	-	-	-	-	-	-	-	-	-	2	-	-
CO4	3	2	2	-	-	-	-	-	-	-	-	-	2	-	-
CO5	3	2	2	-	-	-	-	-	-	-	-	-	2	2	-
CO6	2	2	-	-	-	-	-	-	-	-	-	-	2	-	-
	3	2	2	-	-	-	-	-	-	-	-	2	2	2	-

Unit	Contents of the Unit	Hou rs	Cos
1	OVERVIEW-Introduction: What operating systems do; Operating system architecture, Operating System Structure, Operating System operations. System Structures: Operating System Services, System calls, Types of System calls, Virtual Machines	08	CO1
2	PROCESS MANAGEMENT:- Process concept: Process scheduling, interprocess communication, Multithreaded programming: Overview; Multithreading models; Process Scheduling: Basic concepts, scheduling criteria, Scheduling algorithms: FCFS (5.3.1), SJF(5.3.2), Priority Scheduling(5.3.3) and Round Robin Scheduling(5.3.4).	08	CO2 & CO5

3	PROCESS COORDINATION- Synchronization: The Critical section problem, Peterson's solution, Semaphores; Classical problems of synchronization: Bounded-Buffer Problem, Reader's-Writer's Problem. Deadlocks: System model; Deadlock characterization; Methods for handling deadlocks; Deadlock prevention; Deadlock avoidance; Deadlock detection and recovery from deadlock.	08	C03 & C05
4	MEMORY MANAGEMENT-Memory Management Strategies: Background, Contiguous memory allocation, Paging, Segmentation Virtual Memory management: Background, Demand Paging, Basic Page Replacement Algorithms: FIFO(9.4.2), Optimal(9.4.3), LRU(9.4.4),	08	C04 C05
5	STORAGE MANAGEMENT-File System: File concept, Access methods, Protection. Secondary Storage Structures: Overview of Mass storage structures; Disk scheduling algorithms. PROTECTION AND SECURITY-System Protection: Goals of protection, Principles of protection, Domain of protection, Access matrix.	08	C06

Self study component:

Note: 1. Questions for CIE and SEE not to be set from self-study component.

2. Assignment Questions should be from self-study component only.

UNIT 1: Distributed system, Operating System structure;

UNIT2 :Threading Issues, Thread Libraries.

UNIT3 :Peterson's solution, Dining Philosopher's Problem, Monitors.

UNIT4 :Swapping, Thrashing.

UNIT5 :File System Structure, File System Implementation.

Text books:

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne: Operating System Principles, 8th edition, Wiley India, 2011

Reference books

1. D.M Dhamdhare: Operating systems - A concept based Approach, 2nd Edition, Tata McGraw- Hill, 2002.

2. P.C.P. Bhatt: Introduction to Operating Systems: Concepts and Practice, 2nd Edition, PHI, 2008.
3. Harvey M Deital: Operating systems, 3rd Edition, Pearson Education, 1990.

Assessment Pattern:

CIE –Continuous Internal Evaluation Theory (50 Marks)

Bloom's Category	Tests	Assignments	AAT1	AAT2
Marks (Out of 50)	30	10	05	05
Remember	--	--	--	--
Understand	10	05	01	01
Apply	10	--	02	01
Analyze	10	05	01	--
Evaluate	--	--	01	02
Create	--	--	--	01

*AAT 1 – Alternate Assessment Tool 1: Quiz

AAT 2 - Alternate Assessment Tool 2: Case Study, Implementation of theoretical concepts

SEE –Semester End Examination Theory (50 Marks)

Bloom's Category	Marks Theory(50)
Remember	10
Understand	10
Apply	10
Analyze	10