

INFORMATION TECHNOLOGY COURSE STRUCTURE

B. Tech. (AUTONOMOUS)

Duration: 4 years (Eight Semesters)

FIFTH SEMESTER

OPERATING SYSTEM

Prerequisites	Basics of Computer, Programming Languages, Computer Organisation, Data Structure and Algorithms
Course Outcomes	<ul style="list-style-type: none">• Understand role of Operating System in terms of process, memory, file and I/O management.• Apply and analyse the concept of a process, thread, mutual exclusion and deadlock.• Evaluate performance of process scheduling algorithms and IPC.• Apply and analyse the concepts of memory management techniques. Evaluate the performance of memory allocation and replacement techniques.• Apply and analyze different techniques of file and I/O management.

MODULE-I 12 Hours

INTRODUCTION TO OPERATING SYSTEM: Basics of Computer System Architecture and Organization, Simple Batch Systems, Multiprogramming and Time Sharing systems. Personal Computer Systems, Parallel Systems, Distributed Systems and Real time Systems, Operating System Services, Operating System Operations, System calls, Operating System Structures

PROCESS MANAGEMENT: Process Concept, Process Scheduling, Operation on Processes, Interprocess communication, Threads, Multithreading Models, Thread Libraries, Threading Issues, Process Scheduling Basic concepts, scheduling criteria, scheduling algorithms, Thread Scheduling.

MODULE-II 12 Hours

PROCESS SYNCHRONIZATION: The Critical section problem, Peterson's solution, Synchronization hardware, Semaphores, Classical problems of synchronization, Monitors.

DEADLOCKS: System model, Deadlock Characterization Methods for Handling Deadlocks, Deadlock Prevention, Deadlock avoidance, Deadlock Detection, recovery from Deadlock.

MEMORY MANAGEMENT: Memory Management strategies, Logical versus Physical Address space, swapping, contiguous Allocation, Paging, Segmentation.

Virtual Memory: Background, Demand paging, performance of Demand paging, Page Replacement, Page Replacement Algorithms, Allocation of frames, Thrashing, Demand Segmentation.

MODULE-III 11 Hours

STORAGE MANAGEMENT: File System Concept, Access Methods, File System Structure, File System Structure, File System Implementation, Directory implementation, Efficiency and Performance, Recovery, Overview of Mass Storage Structure, Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management, I/O System Overview, I/O Hardware, Application I/O Interface, Kernel I/O Subsystem, Transforming I/O Request to Hardware Operation.

TEXT BOOK:

1. Operating System Concepts – Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, 8th edition, Wiley-India, 2009.
2. Operating Systems: Internals And Design Principles- William Stallings, 6th Edition, Pearson, 2009

REFERENCE BOOK:

1. Principles of Operating Systems-Naresh Chauhan, Oxford University Press, 2014
2. Modern Operating Systems – Andrew S. Tanenbaum, 3rd Edition, PHI
3. Operating Systems: A Spiral Approach – Elmasri, Carrick, Levine, TMH Edition
4. Operating Systems – H.M. Deitel, P. J. Deitel, D. R. Choffnes, 3rd Edition, Pearson

Abbreviations Used: L = Lectures, P = Practical or Laboratory, T = Tutorial

IA = Internal Assessment , PA = Practical Assessment, EA = End-Semester Assessment