

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE MODULE FOR THE SESSION 2025-26(ODD SEMESTER)

Course Syllabi with CO's

Academic Year: 2026- 27							
Department: Computer Science & Engineering							
Course	Course Title	Core/Elective	Prerequisite	Contact Hours			Total Hrs / Sessions
				L	T	P	
1BCS304	Operating Systems	Core	Fundamentals of computer hardware and software	3	-	-	42T
Objectives: - To Demonstrate the need for OS and different types of OS - To discuss suitable techniques for management of different resources - To demonstrate different APIs/Commands related to processor, memory,							
Topics Covered as per Syllabus							
Module -1 Introduction to operating systems, System structures: What operating systems do; Computer System organization; Computer System architecture; Operating System structure; Operating System operations; Process management; Memory management; Storage management. Operating System Services: User - Operating System interface; System calls; Types of system calls; System programs; Operating system design and implementation; Operating System structure;							
Module -2 Process Management: Process concept; Process scheduling; Operations on processes; Inter-process communication, communication. Multi-threaded Programming: Overview; Multithreading models; Thread Libraries; Threading issues. Process Scheduling: Basic concepts; Scheduling Criteria; Scheduling Algorithms; Thread scheduling; Multiple-processor scheduling.							
Module -3 Process Synchronization: Synchronization: The critical section problem; Peterson's solution; Synchronization hardware; Semaphores; Classical problems of synchronization; Deadlocks: System model; Deadlock characterization; Methods for handling deadlocks; Deadlock prevention; Deadlock avoidance; Deadlock detection and recovery from deadlocks							

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Module -4

Memory Management: Memory management strategies: Background; Swapping; Contiguous memory allocation; Paging; Structure of page table; Segmentation. Virtual Memory Management: Background; Demand paging; Copy-on-write; Page replacement; Allocation of frames; Thrashing.

Module - 5

File System: File system: File concept; Access methods; Directory and Disk structure; File system mounting; File sharing.

Implementing File system: File system structure; File system implementation; Directory implementation; Allocation methods; Free space management.

Mass Storage Structure: Mass storage structures; Disk structure; Disk attachment; Disk scheduling; Disk management.

Text Books:

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Operating System Principles 9th Edition, Wiley-India, 2009

Reference Books

1. Ann Mc Hoes Ida M Fylnn, Understanding Operating System, Cengage Learning, 6th Edition
2. D.M Dhamdhare, Operating Systems: A Concept Based Approach 3rd Ed, McGraw-Hill, 2013.
3. William Stallings Operating Systems: Internals and Design Principles, 6th Edition, Pearson.

List of URL's

1. <http://nptel.ac.in/courses/106106144>
2. https://en.wikipedia.org/wiki/Operating_system
3. https://www.tutorialspoint.com/operating_system

Course outcomes: The students should be able to:

- Course outcomes (Course Skill Set): At the end of the course, the student will be able to:
- CO 1. Explain the structure and functionality of operating system
- CO 2. Apply appropriate CPU scheduling algorithms for the given problem.
- CO 3. Analyze the various techniques for process synchronization and deadlock handling.
- CO 4. Apply the various techniques for memory management
- CO 5. Explain file and secondary storage management strategies.
- CO 6. Describe the need for information protection mechanisms

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

The Correlation of CO –PO-PSO

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
C01	3	2	2	-	-	-	-	-	-	-	-	-	-
C02	3	2	2	-	-	-	-	-	-	-	-	-	-
C03	3	2	2	-	-	-	-	-	-	-	-	-	-
C04	3	2	2	-	-	-	-	-	-	-	-	-	-
C05	3	2	2	-	-	-	-	-	-	-	-	-	-
C06	3	2	2	-	-	-	-	-	-	-	-	-	-

Note: 3 = Strong Contribution 2 = Average Contribution 1= Weak Contribution - = No Contribution