

**Department of Computer Science & Design****COURSE MODULE FOR THE SESSION 2023-24(ODD SEMESTER)****Course Syllabus with CO's****Academic Year:** 2023 - 2024**Department:** Computer Science & Design

Course Code	Course Title	Core/Elective	Prerequisite	Contact Hours			Total Hrs/ Sessions
				L	T	P	
BCS303	Operating Systems	Core	Fundamentals of computer hardware and software	3	-	2	40

Objectives:

- Introduce concepts and terminology used in OS
- Explain threading and multithreaded systems
- Illustrate process synchronization and concept of Deadlock.
- Introduce Memory and Virtual memory management, File system and storage techniques

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; Protection and Security; Distributed system; Special-purpose systems; Computing environments.

Operating System Services: User - Operating System interface; System calls; Types of system calls; System programs; Operating system design and implementation; Operating System structure; Virtual machines; Operating System debugging, Operating System generation; System boot.

Module -2

Process Management: Process concept; Process scheduling; Operations on processes; Inter process 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 deadlock.

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

Module -5 File System, Implementation of 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. Secondary Storage Structure, Protection: Mass storage structures; Disk structure; Disk attachment; Disk scheduling; Disk management; Protection: Goals of protection, Principles of protection, Domain of protection, Access matrix.													
Textbooks:													
1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Operating System Principles 8th edition, Wiley-India, 2015													
Reference Books													
1. Ann McHoes Ida M Fylnn, Understanding Operating System, Cengage Learning, 6th Edition 2 2. D.M Dhamdhare, Operating Systems: A Concept Based Approach 3rd Ed, McGraw- Hill, 2013. 3. P.C.P. Bhatt, An Introduction to Operating Systems: Concepts and Practice 4th Edition, PHI(EEE), 2014.													
List of URL's													
1. https://youtu.be/mXw9ruZaxzQ 2. https://youtu.be/vBURTt97EkA 3. 3. https://www.youtube.com/watch?v=783KABtuE4&list=PLIemF3uozcAKTgsCIj82voMK3TMR0YE_f													
Course outcomes: The students should be able to:													
<ul style="list-style-type: none"> • Demonstrate need for OS and different types of OS • Apply suitable techniques for management of different resources • Use processor, memory, storage and file system commands • Realize the different concepts of OS in platform of usage through case studies 													
Internal Assessment Marks: 40 (3 Session Tests are conducted during the semester and Marks allotted based on average of all performances).													

The Correlation of Course Outcomes (CO's) and Program Outcomes (PO's)

Subject Code	BCS303				Title: Operating Systems								
List of Course Outcomes	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	Total
CO-1	3	2	2	-	-	-	-	-	-	-	-	-	7
CO-2	3	2	2	-	-	-	-	-	-	-	-	-	7
CO-3	3	2	2	-	-	-	-	-	-	-	-	-	7
CO-4	3	2	2	-	-	-	-	-	-	-	-	-	7
Total	12	8	8	-	-	-	-	-	-	-	-	-	28

The Correlation of Program Specific Outcome's (PS0's) and Course Outcome (CO's)

Subject Code	BCS303	Title: Operating Systems	
List of Course Outcome's	PSO1	PSO2	Total
CO-1	-	-	-
CO-2	-	-	-
CO-3	-	-	-
CO-4	-	-	-
Total	-	-	-

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

