Marwadi University

FACULTY OF COMPUTER APPLICATIONS
Bachelor of Computer Applications

- **Sem.** 4
- **Subject Code** : 05BC3401
- **Subject** : Operating System
- **Course Objectives**:

1. To understand the overall structure and components of operating system.
2. To analyze the key concept of process management and thread management.
3. To understand the concurrency problem and solutions.
4. To understand concepts of Main Memory and Virtual Memory.
5. To understand the management of files and I/O devices.

- **Prerequisites** : Basic knowledge of computers

Unit No	Topics Covered	No of lectures required
1	**Operating System Overview:** Introduction, Operating System Objectives and functions, Evolution of Operating System, Major achievements, Characteristics of Modern Operating System	8
2	**Process Management and Thread Management:** **Process Management:** Process, Process States **Scheduling:** Types of processor scheduling, Scheduling algorithms **Thread management:** Processes and Threads: Multithreading, Thread Functionality, Process Vs. Threads, User level threads and kernel level threads	10
3	**Concurrency & Deadlocks** **Concurrency:** Key terms related to concurrency, Requirements of mutual exclusion, Semaphores	9

	Deadlocks: Principles Of Deadlock, Deadlock Prevention, Deadlock avoidance, Deadlock Detection, Dinning philosophers problem: Solution using semaphores	
4	**Memory Management & Virtual Memory:** **Memory Management:** Requirements of memory management, Memory Partitioning, Simple Paging and Simple segmentation **Virtual Memory:** Hardware and Control Structures: Need of virtual memory, Virtual Memory paging, Virtual memory segmentation, Address translation in paging, Address translation in segmentation, Page Replacement Policy	**9**
5	**Input/ Output and Files** I/O Management and Disk Scheduling: I/O Devices, Organization of I/O function, I/O buffering, Disk Scheduling, RAID **File Management:** Overview, File organization and access, File directories, File sharing, Record blocking, secondary storage management	**9**

Course Outcomes :

Students will be able to

1. Understand the structure and components of Operating System
2. Understand process and thread management.
3. Analyze concurrency problems and to provide solution.
4. Understand the working of main memory and virtual memory.
5. Understand the management of files and I/O devices.

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Course Outcomes – Program Outcomes Mapping Table :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	H					L	M	L	L		
CO2	H	M	M			M	M	L	M	H	M
CO3	H	H	M			M	M	L	M	H	M
CO4	H	H	M			M	M	L	M	H	M
CO5	H	H	M			M	M	L	M	H	L

Text Book :

1. "Operating Systems", Stalling W, Prentice Hall India, 7th edition

Reference Books :

1. "Operating System Principles",Silberschatz A., Peter B. Galvin and Greg Gagne, Wiley-Indian, 8TH edition.
2."Modern Operating Systems", Tanenbaum A.S., PHI, 4th Edition
3. "Unix Shell Programming ", Yashvant Kanetkar , BPB Publications , 1st edition.
4. "Unix Concepts and Applications ", Sumitabha Das , McGraw-Hill Publications, 4th edition.

Web References :

1. https://www.javatpoint.com/os-tutorial
2. https://www.geeksforgeeks.org/operating-systems/

App References :

1. Operating System Tutorials
2. AnLinux : Run Linux on Android
3. Linux Tutorial

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Syllabus Coverage from text /reference book & web/app reference:

Unit #	Chapter Numbers
1	2-2.1 ,2.2, 2.3
2	3-3.1,3.2 4- 4.1 , 4.2 9-9.1 , 9.2
3	5 – 5.1, 5.3, 5.6 6 – 6.1, 6.2, 6.3 , 6.4 , 6.6
4	7-7.1,7.2,7.3,7.4 8 – 8.1 , 8.2
5	11-11.1,11.2,11.4,11.5,11.6 12-12.1,12.2,12.3,12.4,12.5,12.6

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PRACTICALS

Sr. No	Command Category
1	Hardware Information
2	User and Group
3	Directory management (ls, pwd, mkdir, rm, cd, dirs, cp, mv)
4	File management (touch, cat, head, tail, more, less)
5	File permissions
6	System management
7	Disk usage and File compression
8	Data Filter and Searching
9	Data Filter and Searching
10	Data Filter and Searching
11	Data Filter and Searching
12	Shell Scripting 1 (Types, Variables, Operators, Conditional Statements)
13	Shell Scripting 2 (Looping)
14	Shell Scripting 3 (File Related commands)
15	Shell Scripting 4 (String test commands, command line arguments)