C.U.SHAH UNIVERSITY – WADHWANCITY

FACULTY OF TECHNOLOGY AND ENGINEERING
DEPARTMENT OF INFORMATION TECHNOLOGY
B. TECH. SEMESTER: - IV

SUBJECT NAME: -Operating System(OPS) SUBJECT CODE: -4TE04OPS1

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme							
							Theory				Practical (Marks)			Total
							Sessional Exam		University Exam		Internal		University	
		Th	Tu	Pr	Total		Marks	Hours	Marks	Hours	Pr/Viva	TW	Pr	
4TE04OPS1	Operating System	4	0	2	6	5	30	1.5	70	3.0	30	20	-	**150**

Objectives:

- To provide basic understanding of structure and functionality of various operating systems. It begins with the fundamental of operating system and then functionality of operating system like Process Management, Memory Management, Deadlock Management, Storage Management, I/O Management, Protection and Security.

Prerequisites:

- Programming in C and basics of Computer Communication

Course outline:

Sr. No.	Course Contents	Total Hours
1	**OVERVIEW:** What is an Operating System?, Evolution of Operating System, Operating-System Services, Types of OS, Concepts of OS, Different Views of OS, Operating-System Structure, System Calls, System Programs	05
2	**PROCESS MANAGEMENT:** Processes, Process Concept, Process Scheduling, Operations on Processes, Interprocess Communication, Communication in Client-Server Systems, Threads Overview, Multithreading Models, Threading Issues, CPU Scheduling, Scheduling Criteria, Scheduling Algorithms, Process Synchronization, Critical-Section Problem, Peterson's Solution, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Deadlocks, System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery From Deadlock	18
3	**MEMORY MANAGEMENT:** Main Memory, Swapping, Contiguous Memory Allocation, Paging, Structure of the Page Table, Segmentation, Virtual Memory, Demand Paging, Page Replacement, Allocation of Frames, Thrashing, Memory-Mapped Files	10

4	**STORAGE MANAGEMENT:** File Concept, Access Methods, Directory Structure, File-System Mounting, File Sharing, Protection, File-System Structure, File-System Implementation, Directory Implementation, Allocation Methods, Free-Space Management, Recovery, Log-Structured File Systems, NFS, Overview of Mass-Storage, Disk Structure, Disk Scheduling, Disk Management, RAID Structure, I/O Systems Overview, I/O Hardware, Application I/O Interface	15
5	**PROTECTION AND SECURITY:** Protection, Goals and Principles of Protection, Access Matrix, Access Control, Revocation of Access Rights, Security, the Security Problem, Threats	07

Learning Outcomes:

Students will be able to

1. Operate different operating system like WINDOWS/UNIX/LINUX.
2. Get familiar with the knowledge of operating system.
3. Distinguish various OS.

Books Recommended:

1. Operating System ConceptsBy **Abraham Silberschatz, Peter Baer Galvin, Greg Gagne**, John Wiley &Sons, 8th edition, 2010.
2. Modern Operating Systems By**Andrew S. Tanenbaum**, Pearson Education, 4th edition, 2014.
3. Operating System – Internals & Design Principles -By **William Stallings,** Pearson Prentice hall, 5th Edition, 2009.
4. Operating Systems **By D.M.Dhamdhare**, Tata McGraw Hill, 1st edition, 2009.
5. Unix System Concepts & Applications By **Sumitabha Das**, Tata McGraw Hill, 4th edition, 2008.
6. Unix Shell Programming By **YashwantKanitkar,** BPB Publications, 2002.