

GUJARAT TECHNOLOGICAL UNIVERSITY

Information and Communication Technology

B.E Semester: 4

Subject Code: **140702**

Subject Name: **Operating System**

Sr.No	Course content
1.	Introduction: What is an OS?, Evolution Of OS, OS Services, Types Of OS, Concepts of OS, Different Views Of OS, Concepts of OS
2.	Process Management: Process, Process Control Block, Process States, Threads, Types of
3.	Interprocess Communication: Race Conditions, Critical Section, Mutual Exclusion, Hardware Solution, Strict Alternation, Peterson's Solution, The Producer Consumer Problem, Semaphores, Event Counters, Monitors, Message Passing, Classical IPC Problems: Reader's & Writer Problem, Dining Philosopher Problem etc., Scheduling, Scheduling Algorithms.
4.	Deadlock: Deadlock Problem, Deadlock Characterization, Deadlock Detection, Deadlock recovery, Deadlock avoidance: Banker's algorithm for single & multiple resources, Deadlock Prevention.
5.	Memory Management: Paging: Principle Of Operation, Page Allocation, H/W Support For Paging, Multiprogramming With Fixed partitions, Segmentation, Swapping, Virtual Memory: Concept, Performance Of Demand Paging, Page Replacement Algorithms, Thrashing, Locality.
6.	Input Output Management Principles of Input/Output H/W : I/O Devices, Device Controllers, Direct Memory Access, Principles Of Input/Output S/W : Goals Of The I/O S/W, Interrupt Handler, Device Driver, Device Independent I/O Software Disks : RAID levels, Disks Arm Scheduling Algorithm, Error Handling
7.	File Systems Files : File Naming, File Structure, File Types, File Access, File Attributes, File Operations, Memory Mapped Files, Directories : Hierarchical Directory System, Pathnames, Directory Operations, File System Implementation.

8.	Implementing Files : Contiguous Allocation, Linked List Allocation, Linked List Using Index, Inodes, Implementing Directories In C, MS-DOS, UNIX. Shared Files, Disk Space Mgmt, File System Reliability, File System Performance
9.	Security : Security Environment, Design Principles Of Security, User Authentication, Protection Mechanism : Protection Domain, Access Control List
10.	Case Study: Unix, Linux, Windows 2000.
11.	Unix/Linux Operating System : Development Of Unix/Linux, Role Of Kernel & Function Of Kernel, System Calls, Elementary Shell Programming, Directory Structure, System Administration
12.	Introduction To Multiprocessor And Distributed Operating System

Reference Books:

1. Modern Operating Systems -By Andrew S. Tanenbaum (PHI)
2. Operating System – Internals & Design Principles -By William Stallings (PHI)
3. Operating Systems By D.M.Dhamdhare (TMH)
4. Unix System Concepts & Applications By Sumitabha Das (TMH)
5. Unix Shell Programming By Yashwant Kanitkar