



**GUJARAT TECHNOLOGICAL UNIVERSITY**

Syllabus for Integrated MSc, 3<sup>rd</sup> Semester

Branch: Information Technology

Subject Name: Operating System

Subject Code: 1330503

**Teaching and Examination Scheme:**

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE(E)	PA (M)	PA (I)	ESE (V)	
4	0	2	5	70	30	20	30	150

**Course Content:**

Sr. No.	Content	Teaching Hours	Module Weightage (%)
1	<b>Operating System Concepts:</b> Evolution of Operating System, Need of an Operating System, Elements of an Operating System, Types of OS ,Operating system structure – Layered, Microkernel, Virtual Machine	05	10%
2	<b>Process Management:</b> Process Concept, Process State model, <b>Process scheduling</b> – Criteria ,Algorithm, Thread and Multithreading, Inter-process Communication, <b>Process Coordination</b> - Critical Section problem, Semaphores, <b>Deadlocks</b> - Deadlock Characteristics, Deadlock Prevention, Avoidance, Deadlock Detection, Recovery	15	40%
3	<b>Memory Management :</b> The notion of physical and logical address space, Contiguous allocation, <b>Non-Contiguous allocation</b> – Paging, Segmentation , Other Memory Management Schemes: Swapping and Overlays, Demand Paging & Demand Segmentation, Allocation of frames & Page Replacement policies	08	30%
4	<b>File and Device Management:</b> <b>File Management</b> - Device Characteristics, I/O Hardware, Application I/O Interface, Kernel I/O Subsystem, STREAMS, <b>Mass Storage Structure</b> - Disk Structure, Disk scheduling, Disk Management	06	10%
5	<b>Unix/Linux Operating System:</b> Development Of Unix/Linux, Role & Function Of Kernel, System Calls, Elementary Linux command & Shell Programming, Directory Structure, System Administration Case study: Linux, Windows Operating System	06	10%

**Suggested Specification table with Marks (Theory):**

Distribution of Theory Marks				
R Level	U Level	A Level	N Level	E Level
30	20	20	-	-

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate and above Levels (Bloom’s Taxonomy)



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## Reference Books:

1. Operating Systems Concepts - Galvin Silberschatz - McGraw Hill-9th Edition
2. Operating Systems - William Stallings — PHI- 9th Edition
3. Modern Operating Systems - Andrew S. Tanenbaum - Pearson Edu./PHI -4<sup>th</sup> edition
4. Operating System, Dhamdhere, TMH-3rd Edition
5. Understanding Operating System, Ann McIver McHoes Ida Flynn, Sth Edition
6. Operating System, P Balakrishna Prasad, Scitech- 2nd Edition
7. Unix Shell Programming : Yashwant Kanetkar: 2003 Edition
8. Mastering Linux shell Scripting: Andrew Mallett:2015 edition Packt Publisher

## Course Outcome:

After learning the course, the students should be able to:

Sr. No.	CO statement
CO-1	Analyze the structure of OS and basic architectural components involved in OS design.
CO-2	Compare and contrast various CPU scheduling algorithms.
CO-3	Evaluate the requirements for the process synchronization and coordination in contemporary operating system.
CO-4	Analyze various algorithms for memory management, I/O management of operating system.
CO-5	Write shell scripts in Unix/Linux OS and write simple programs using kernel system calls.