

Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		L	T	P	L	T	P	Total
MCA21	Operating System	4	--	--	4	--	--	4
		Examination Scheme						
		ISE		MSE		ESE		
		10	30	100 (60% Weightage)				

<b>Prerequisite Course codes</b>	-	
<b>Course Outcomes</b>	<b>CO1</b>	Classify different types of operating system designs
	<b>CO2</b>	Analyse process management, I/O management, memory management functions of Operating System
	<b>CO3</b>	Employ process scheduling and disk scheduling algorithms.
	<b>CO4</b>	Explore file management and protection and security concepts.

Module No.	Unit No.	Topics	Ref.	Hrs
<b>1</b>		<b>Introduction to operating System</b>	<b>1</b>	<b>5</b>
	<b>1.1</b>	Overview of all system softwares: Compiler, Assembler, Linker, Loader,		
	<b>1.2</b>	Operating system, OS services and Components		
	<b>1.3</b>	Types of OS-Batch, multiprocessing, multitasking, timesharing		
	<b>1.4</b>	Distributed OS ,Real time OS, virtual machines		
	<b>1.5</b>	System Calls ,types of System calls, Buffering, Spooling		
<b>2</b>		<b>Process and Thread Management</b>	<b>2</b>	<b>10</b>
	<b>2.1</b>	Concept of process and threads, Process states, Process management		
	<b>2.2</b>	Context switching, Interaction between processes and OS, Multithreading		
	<b>2.3</b>	CPU scheduling algorithms, multiprocessor scheduling algorithms		
	<b>2.4</b>	Real time scheduling algorithms		
<b>3</b>		<b>Concurrency Control</b>	<b>3</b>	<b>8</b>
	<b>3.1</b>	Concurrency and Race Conditions		
	<b>3.2</b>	Mutual exclusion requirements, Software and hardware solutions		
	<b>3.3</b>	Semaphores, Monitors, Classical IPC problems and solutions		
	<b>3.4</b>	Deadlock, Characterization, Detection, Recovery, Avoidance and Prevention		
<b>4</b>		<b>Memory Management</b>	<b>5</b>	<b>10</b>
	<b>4.1</b>	Memory partitioning, Swapping, Paging, Segmentation		

	4.2	Virtual memory, Overlays, Demand paging, Performance of Demand paging,		
	4.3	Virtual memory concepts		
	4.4	Page replacement algorithms, Allocation algorithms		
<b>5</b>		<b>Mass Storage Structure</b>	<b>3</b>	<b>7</b>
	5.1	Secondary-Storage Structure, Disk structure		
	5.2	Disk scheduling, Disk management, Swap-space management, Disk reliability		
	5.3	Stable storage implementation, Introduction to clock, Clock hardware, Clock software		
<b>6</b>		<b>File systems</b>	<b>3</b>	<b>4</b>
	6.1	File concept, File support, Access methods, Allocation methods		
	6.2	Directory systems, File protection, Free space management		
<b>7</b>		<b>Protection &amp; Security</b>	<b>5</b>	<b>4</b>
	7.1	Protection- Goals of protection, Domain of protection, Access matrix, Implementation of access matrix		
	7.2	Revocation of access rights Security- The security problem, Authentication, One-Time passwords, Threats		
<b>8</b>		<b>Case Study</b>		<b>4</b>
	8.1	Study of different Operating, Systems(Linux, Windows, Android OS, iOS)		
			<b>Total</b>	<b>52</b>

### References:

- [1] Silberschatz and Galvin , “Operating System Concepts” , Wiley ,9th Edition .
- [2] William Stallings , “Operating Systems (5th Ed) – Internals and Design Principles” , Prentice Hall, 2000.
- [3] Andrew S Tanenbaum , “Modern Operating Systems” , Prentice Hall India, 1992,Third Edition.
- [4] Gary Nutt, NabenduChaki, SarmishthaNeogy, “Operating Systems”, Pearson ,3rd Edition.
- [5] Andrew S. Tanenbaum, AlbertS. Woodhull , “Operating Systems Design & Implementation Andrew”, Pearson, Third Edition.
- [6] Achyut S. Godbole, “ Operating Systems”, Tata McGraw Hill ,Second Edition.
- [7] D.M.Dhamrdhere , “Operating Systems” , Tata McGraw Hill, Second Edition.