

OPERATING SYSTEMS

IV Semester: CSE / IT								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
AITB04	Core	L	T	P	C	CIA	SEE	Total
		3	1	-	4	30	70	100
Contact Classes: 45		Tutorial Classes: 15		Practical Classes: Nil		Total Classes: 60		
COURSE OBJECTIVES:								
I	The principles of operating system, its services and functionalities with the evolution of operating systems.							
II	The concepts of processes, inter-process communication, synchronization and scheduling used in process management.							
III	The concepts related to memory management, paging, and segmentation including protection and security mechanisms used in computer systems.							
IV	The deeper insights into the reasons for deadlock occurrences, techniques used for deadlock detection, prevention and recovery.							
COURSE OUTCOMES:								
CO 1	Describe the importance of computer system resources for designing operating systems security policies.							
CO 2	Demonstrate process control blocks and threads used in scheduling the process.							
CO 3	Classify the importance of system calls to different Applications Programming Interface in developing operating systems.							
CO 4	Construct the critical section problem used for process synchronization.							
CO 5	Distinguish logical and physical address space applied in process management							
CO 6	Construct various page replacement algorithms applied for allocation of frames.							
CO 7	Describe the use of storage management policies with respect to different storage management technologies.							
CO 8	Classify the different access methods used for file management systems.							
CO 9	Demonstrate the working of operating systems as a resource manager and file system manager used for implementing different parts of operating systems.							
CO 10	Describe the concept of free space management to improve efficiency and performance of operating systems.							
CO 11	Make use of various methods of handling deadlocks used for system models.							
CO 12	Make use of access rights to implement language based protection.							

MODULE-I	INTRODUCTION	Hours: 10
<p>Operating systems objectives and functions: Computer system architecture, operating systems structure, operating systems operations; Evolution of operating systems: Simple batch, multi programmed, time shared, personal computer, parallel distributed systems, real time systems, special purpose systems, operating system services, user operating systems interface; Systems calls: Types of systems calls, system programs, protection and security, operating system design and implementation, operating systems structure, virtual machines.</p>		
MODULE -II	PROCESS AND CPU SCHEDULING, PROCESS COORDINATION	Hours: 10
<p>Process concepts: The process, process state, process control block, threads; Process scheduling: Scheduling queues, schedulers, context switch, preemptive scheduling, dispatcher, scheduling criteria, scheduling algorithms, multiple processor scheduling; Real time scheduling; Thread scheduling; Case studies Linux windows; Process synchronization, the critical section problem; Peterson's solution, synchronization hardware, semaphores and classic problems of synchronization, monitors.</p>		
MODULE -III	MEMORY MANAGEMENT AND VIRTUAL MEMORY	Hours: 08
<p>Logical and physical address space: Swapping, contiguous memory allocation, paging, structure of page table.</p> <p>Segmentation: Segmentation with paging, virtual memory, demand paging; Performance of demand paging: Page replacement, page replacement algorithms, allocation of frames, thrashing.</p>		
MODULE -IV	FILE SYSTEM INTERFACE, MASS-STORAGE STRUCTURE	Hours: 09
<p>The concept of a file, access methods, directory structure, file system mounting, file sharing, protection, file system structure, file system implementation, allocation methods, free space management, directory implementation, efficiency and performance; Overview of mass storage structure: Disk structure, disk attachment, disk scheduling, disk management, swap space management; Dynamic memory allocation: Basic concepts; Library functions.</p>		
MODULE -V	DEADLOCKS, PROTECTION	Hours: 08
<p>System model: Deadlock characterization, methods of handling deadlocks, deadlock prevention, dead lock avoidance, dead lock detection and recovery form deadlock system protection, goals of protection, principles of protection, domain of protection, access matrix, implementation of access matrix, access control, revocation of access rights, capability based systems, language based protection.</p>		
Text Books:		
<ol style="list-style-type: none"> 1. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, "Operating System Principles", Wiley Student Edition, 8th Edition, 2010. 2. William Stallings, "Operating System- Internals and Design Principles", Pearson Education, 6th Edition, 2002. 		
Reference Books:		
<ol style="list-style-type: none"> 1. Andrew S Tanenbaum, "Modern Operating Systems", PHI, 3rd Edition, 2007. 2. D. M. Dhamdhare, "Operating Systems a Concept based Approach", Tata McGraw Hill, 2nd Edition, 2006. 		
Web References:		
<ol style="list-style-type: none"> 1. www.smartzworld.com/notes/operatingsystems 2. www.scoopworld.in 3. www.technofest2u.blogspot.com 		

E-Text Books:

1. <https://it325blog.files.wordpress.com/2012/09/operating-system-concepts-7-th-edition.pdf>
2. <http://mpathinveco.blog.com/2014/11/25/operating-systems-william-stalling-6th-edition/>
3. <http://www.e-booksdirectory.com/details.php?ebook=10050>
4. <http://www.e-booksdirectory.com/details.php?ebook=9907>
5. <http://www.e-booksdirectory.com/details.php?ebook=9460>