

MANGALORE UNIVERSITY
DEPARTMENT OF M.Sc. COMPUTER SCIENCE

CSH 451: ADVANCED OPERATING SYSTEM		
Hours/Week: 4 Credits : 4		I.A. Marks: 30 Exam. Marks: 70
<u>Course Outcomes:</u> CO1: Analyze the structure of OS and basic architectural components involved in OS design CO2: Analyze and design the applications to run in parallel either using process or thread models of different OS CO3: Analyze the various device and resource management techniques for timesharing and distributed systems CO4: Understand the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system CO5: Interpret the mechanisms adopted for file sharing in distributed Applications CO6: Conceptualize the components involved in designing a contemporary OS		
	UNIT-I	12 Hrs.
Operating System Overview : Operating System Objectives and Functions, The Evolution of Operating Systems, Major Achievements, Developments Leading to Modern Operating Systems, Microsoft Windows Overview, Traditional UNIX Systems, Modern UNIX Systems, Linux. Process description & control : What is a Process?, Process States, Process Description, Process Control, Execution of the Operating System, Security Issues, UNIX SVR4 Process Management.		
	UNIT-II	12 Hrs.
Threads, SMP, and Microkernel: Processes and Threads, Symmetric Multiprocessing (SMP), Microkernels, Windows Vista Thread and SMP Management, Solaris Thread and SMP Management, Linux Process and Thread Management..		
Virtual Memory : Hardware and Control Structures, Operating System Software, UNIX and Solaris Memory Management, Linux Memory Management, Windows Vista Memory Management, Summary.		

	UNIT-III	12 Hrs.
Multiprocessor and Real-Time Scheduling: Multiprocessor Scheduling, Real-Time Scheduling, Linux Scheduling, UNIX Preemptive Scheduling, Windows Vista Scheduling. Distributed Process Management: Process Migration, Distributed Global States, Distributed Mutual Exclusion, Distributed Deadlock. Security: Security Threats, Attacks, and Assets, Intruders, Malicious Software Overview, Viruses, Worms, and Bots, Rootkits		
	UNIT-IV	12 Hrs.
Kernel Organization: Using Kernel Services, Daemons, Starting the Kernel, Control in the Machine, Modules and Device Management, Module Organization, Module Installation and Removal, Process and Resource Management, Running Process Manager, Creating a new Task, IPC and Synchronization, The Scheduler, Memory Manager, The Virtual Address Space, The Page Fault Handler, File Management. The windows NT/2000/XP kernel: Introduction, The NT kernel, Objects, Threads, Multiplication Synchronization, Traps, Interrupts and Exceptions, The NT executive, Object Manager, Process and Thread Manager, Virtual Memory Manager, I/O Manager, The cache Manager, Kernel local procedure calls and IPC, The native API, subsystems.		
REFERENCE BOOKS: 1. William Stallings: Operating Systems: Internals and Design Principles, 6th Edition, Prentice Hall, 2013. 2. Gary Nutt: Operating Systems, 3rd Edition, Pearson, 2014. 3. Silberschatz, Galvin, Gagne: Operating System Concepts, 8th Edition, Wiley, 2008 4. Andrew S. Tanenbaum, Albert S. Woodhull: Operating Systems, Design and Implementation, 3rd Edition, Prentice Hall, 2006. 5. Pradeep K Sinha: Distributed Operating Systems, Concept and Design, PHI, 2007.		