MANGALORE UNIVERSITY

DEPARTMENT OF M.Sc. COMPUTER SCIENCE

MASTER OF COMPUTER APPLICATIONS (MCA) PROGRAMME

MCAH201 : ADVANCED OPERATING SYSTEM

Hours/Week: 4 **Credits : 4**		**I.A. Marks: 30** **Exams. Marks: 70**

Course Outcomes:

CO1: Understanding the difference between a distributed and "traditional" system.
CO2: Identifying characteristics of distributed systems.
CO3: Ability to estimate if a system takes distributed system characteristic into account in a reasonable way.
CO4: Knowing the basic structures (e.g. client-server) and knowing the existing middleware frameworks.
CO5: Ability to estimate framework suitability for different applications.
CO6: Ability to implement a simple distributed software laboratory work with socket and RMI interfaces.
CO7: Understanding the mathematical principles behind validity of algorithms solving the problems of distribution.
CO8: Understanding the problems that will arise if atomicity and timing issues are not handled in a distributed application.

	UNIT-I	**12 Hours**

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 aProcess?,ProcessStates,ProcessDescription,ProcessControl,Execution of the Operating System, Security Issues, UNIX SVR4 Process Management.

	UNIT-II	**12 Hours**

Threads, SMP, and Microkernel: Processes and Threads, Symmetric Multiprocessing (SMP), Microkernels, Windows Vista Thread and SMPManagement, Solaris Thread and SMP Management, Linux Process and Thread Management..**Virtual Memory :**HardwareandControlStructures, Operating System Software,UNIX and Solaris Memory Management, Linux Memory Management,Windows Vista Memory Management, Summary.

	UNIT-III	**12 Hours**

Multiprocessor and Real-Time Scheduling: Multiprocessor Scheduling, Real-Time Scheduling, Linux Scheduling, UNIX PreclsSl) Scheduling, Windows VistaScheduling.

Distributed Process Management: ProcessMigration, DistributedGlobal States, Distributed MutualExclusion,DistributedDeadlock. **Security:** Security Threats, Attacks, and Assets, Intruders, Malicious Software Overview, Viruses, Worms, and Bots, Rootkits.

	UNIT-IV	12 Hours

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**, Prentice Hall, 2013, 6th Edition.
2. Gary Nutt: **Operating Systems**, Pearson, 2014, 3rd Edition.
3. Silberschatz, Galvin, Gagne: **Operating System Concepts**, Wiley, 2008, 8th Edition.
4. Andrew S. Tanenbaum, Albert S. Woodhull: **Operating Systems, Design and Implementation**, Prentice Hall, 2006, 3rd Edition.
5. Pradeep K Sinha: **Distributed Operating Systems, Concept and Design**, PHI, 2007.