

## FOURTH SEMESTER (DETAILED SYLLABUS)

BCS401 Operating system		
Course Outcome ( CO)		Bloom's Knowledge Level (KL)
At the end of course , the student will be able to understand		
CO 1	Understand the structure and functions of OS	K <sub>1</sub> , K <sub>2</sub>
CO 2	Learn about Processes, Threads and Scheduling algorithms.	K <sub>1</sub> , K <sub>2</sub>
CO 3	Understand the principles of concurrency and Deadlocks	K <sub>2</sub>
CO 4	Learn various memory management scheme	K <sub>2</sub>
CO 5	Study I/O management and File systems.	K <sub>2</sub> , K <sub>4</sub>
DETAILED SYLLABUS		3-0-0
Unit	Topic	Proposed Lecture
I	<b>Introduction</b> : Operating system and functions, Classification of Operating systems- Batch, Interactive, Time sharing, Real Time System, Multiprocessor Systems, Multiuser Systems, Multiprocess Systems, Multithreaded Systems, Operating System Structure- Layered structure, System Components, Operating System services, Reentrant Kernels, Monolithic and Microkernel Systems.	08
II	<b>Concurrent Processes</b> : Process Concept, Principle of Concurrency, Producer / Consumer Problem, Mutual Exclusion, Critical Section Problem, Dekker's solution, Peterson's solution, Semaphores, Test and Set operation; Classical Problem in Concurrency- Dining Philosopher Problem, Sleeping Barber Problem; Inter Process Communication models and Schemes, Process generation.	08
III	<b>CPU Scheduling</b> : Scheduling Concepts, Performance Criteria, Process States, Process Transition Diagram, Schedulers, Process Control Block (PCB), Process address space, Process identification information, Threads and their management, Scheduling Algorithms, Multiprocessor Scheduling. <b>Deadlock</b> : System model, Deadlock characterization, Prevention, Avoidance and detection, Recovery from deadlock.	08
IV	<b>Memory Management</b> : Basic bare machine, Resident monitor, Multiprogramming with fixed partitions, Multiprogramming with variable partitions, Protection schemes, Paging, Segmentation, Paged segmentation, Virtual memory concepts, Demand paging, Performance of demand paging, Page replacement algorithms, Thrashing, Cache memory organization, Locality of reference.	08
V	<b>I/O Management and Disk Scheduling</b> : I/O devices, and I/O subsystems, I/O buffering, Disk storage and disk scheduling, RAID. <b>File System</b> : File concept, File organization and access mechanism, File directories, and File sharing, File system implementation issues, File system protection and security.	08
<b>Text books:</b> <ol style="list-style-type: none"> <li>1. Silberschatz, Galvin and Gagne, "Operating Systems Concepts", Wiley</li> <li>2. Sibsankar Halder and Alex A Aravind, "Operating Systems", Pearson Education</li> <li>3. Harvey M Dietel, " An Introduction to Operating System", Pearson Education</li> <li>4. D M Dhamdhare, "Operating Systems : A Concept based Approach", 2nd Edition,</li> <li>5. TMH 5. William Stallings, "Operating Systems: Internals and Design Principles ", 6th Edition, Pearson Education</li> </ol>		