Paper Cade: BCADSC 3.4	**Paper Title:** Operating System	**Teaching Hours:** 5 Hrs / Week
Total Teaching Hours: 60Hrs	**Marks:** Th-80+IA-20	**Credits**: 3

UNIT I

Introduction: Basics of Operating Systems: Definition, types of Operating Systems, OS Services, System Calls, OS structure: Layered, Monolithic, Microkernel Operating Systems – Concept of Virtual Machine. **12 Hrs**

UNIT II

Process Management Process Definition, Process states , Process State transitions , Process Control Block , Context switching , Threads, Concept of multithreads, Benefits of threads, Types of threads. Process Scheduling: Definition, Scheduling objectives, Types of Schedulers, CPU scheduling algorithms. **12 Hrs**

UNIT III

Inter-process Communication Race Conditions, Critical Section, Mutual Exclusion, Hardware Solution, Peterson's Solution, The Producer Consumer Problem, Semaphores, Monitors, Message Passing, and Classical IPC Problems. Deadlocks: Definition, Deadlock characteristics, Deadlock Prevention, Deadlock Avoidance: Resource Allocation graph and Banker's Algorithm with problem. **12 Hrs**

UNIT IV

Memory Management: Logical and Physical address map, Memory allocation, Internal and External fragmentation and Compaction, Paging. Virtual Memory: Demand paging, Page Replacement algorithms(FIFO,LRU and Optimal), Allocation of frames, Thrashing. **12 Hrs**

UNIT V

I/O Management- Principles of I/O Hardware: Disk structure, Disk scheduling algorithms File Management: Access methods, File types, File operation, Directory structure, File System structure, Allocation methods, Free-space management, and directory implementation. **12 Hrs**

References:

1. Silberschatz, Peter B. Galvin and Greg Gagne, Operating System Concepts, 9th Edition, WileyIndianEdition
2. Andrew S Tanenbaum, Modern Operating Systems, Third Edition, Prentice HallIndia
3. Sumitabha Das, UNIX Concepts and Applications,4th Edition, Tata McGrawHill

Additional Reading:

1. Milankovic, Operating Systems, Tata McGrawHill
2. Naresh Chauhan, Principles of Operating Systems, OxfordPress
3. D.M. Dhamdhere, Operating Systems: A concept based approach, 2nd edition, Tata McGraw Hill