OE-EC604B	**Operating System**	**3L:0T:0P**	**3 credits**

Introduction:
Operating system and functions, Evolution of operating system, Batch, Interactive, Time Sharing, Real Time System, Multi-Threading System.

Operating System Structure:
System Components, System structure, Operating System Services.

Concurrent Processes:
Process concept, Principle of Concurrency, Critical Section problem, Semaphores, Classical problems in Concurrency, Inter Process Communication, Introduction to monitor, Process Generation, Process Scheduling.

CPU Scheduling:
Scheduling Concept, Performance Criteria SchedulingAlgorithm, Evolution, Multiprocessor Scheduling**.**

Deadlock:
System Model, Deadlock Characterization, Prevention, Avoidance and Detection, Recovery from deadlock combined, approach**.**

Memory Management:
Resident monitor, Multiprogramming with fixed partition, Multiprogramming with variable partition, Multiple base register, Paging, Segmentation, Virtual memory concept, Demand paging, Performance, Page replacement algorithms, Allocation of frames, Thrashing.

I/O Management & Disk Scheduling:
I/O devices and organization of I/O function, I/O Buffering, DISK I/O, Operating System Design Issues.

File System:
File Concept, File Organization and Access Mechanism, File Directories, File Sharing, Implementation Issues.

Operating system Protection & Security:
Introduction to distributed operating system, Case Studies - The UNIX operating system

Text Book

1. Operating System Concepts, A. Silverschwatz, P. Galvin & G.Gange , Willey

Reference Book

1. Operating System Concepts, Milenekovic, McGraw Hill
2. An introduction to operating system, Dietel, Addision Wesley

Course Outcome: At the end of the course, the students will be able to:

1. understand the difference between different types of modern operating systems, virtual machines and their structure of implementation and applications.
2. understand the difference between process & thread, issues of scheduling of user-level processes / threads and their issues & use of locks, semaphores, monitors for synchronizing multiprogramming with
multithreaded systems and implement them in multithreaded programs.
3. understand the concepts of deadlock in operating systems and how they can be managed / avoided and implement them in multiprogramming system.
4. understand the design and management concepts along with issues and challenges of main memory, virtual memory and file system.
5. understand the types of I/O management, disk scheduling, protection and security problems faced byoperating systems and how to minimize these problems.