

## EC 651: Operating Systems

Course code	Course title	Credits			Total Credits	CIE Marks	SEE Marks	Total Marks
		L	T	P				
EC 651	Operating Systems	3	0	0	3	50	50	100

**Course outcome: At the end of the course, the student should be able to**

1. Describe principles of computer architecture, structure & functionalities of different Operating Systems.
2. Analyze and evaluate different algorithms with their core functionalities to improve system performance.
3. Describe various memory management techniques with hardware support.
4. Describe resource allocation methods to avoid deadlock.
5. Describe different security threats and different techniques to counter attack them for different file systems.
6. Implement algorithms as a team member for Operating system functions using programming languages, document and give an effective presentation.

### UNIT 1:

**Introduction and Overview of Operating Systems:** Computer system overview , Goals and Operation of an O.S, Evolution of OS Classes of operating systems, Structure of the supervisor, Operating system with monolithic structure, layered design, Virtual machine operating systems, Kernel-based operating systems, microkernel based OS.

**08 Hours**

### UNIT 2:

**Process Management:** Process concept, Programmer view of processes, OS view of processes, Interacting processes, Threads. Fundamentals of scheduling, Long-term scheduling, Medium and short term scheduling, Real time scheduling, Case studies.

**08 Hours**

### UNIT 3:

**Memory Management:** Memory allocation preliminaries, Contiguous and noncontiguous allocation to programs, Memory allocation for program controlled data, kernel memory allocation, Case studies.

**Virtual Memory:** Virtual memory using paging, Demand paging, Page replacement, Page replacement policies, Memory allocation to programs, Page sharing.

**08 Hours**

#### **UNIT 4:**

**File Management, Deadlock and File Security Techniques:** File organization , File sharing , File system security. Deadlocks in resource allocation , deadlock detection & resolution , dead lock prevention , deadlock avoidance. Computer security concepts, Access control and intrusion detection, Case studies.

**08Hours**

#### **UNIT 5:**

**Device Drivers and Inter-process Communication:** Devices and their characteristics , input output management, ,Disk scheduling algorithm and policies ,Establishing inter-process communication.

**08 Hours**

**Self-Learning Components:** Case studies of algorithms to improve the core functions of operating system.

#### **Text Books:**

1. **D.M.Dhamdhare, "Operating Systems - "A Concept based Approach",** TMH, 3<sup>rd</sup> Ed, 2006.
2. **Willaim Stallings, "Operating System - Internals and Design Systems",** Pearson Education, 6<sup>th</sup> Ed, 2009.
3. **Pramod chanrdra "An introduction to operating systems concepts and practice",** PHI, 3<sup>rd</sup> Ed ,2010
4. **Silberschatz and Galvin, "Operating Systems Concepts",** John Wiley, 8<sup>th</sup> Edition, 2001.

#### **E-Resource:**

1. [https://onlinecourses.nptel.ac.in/noc17\\_cs29/student/home](https://onlinecourses.nptel.ac.in/noc17_cs29/student/home)
2. [http://www.uobabylon.edu.iq/download/M.S20132014/Operating System Concepts, 8th Edition\[A4\]](http://www.uobabylon.edu.iq/download/M.S20132014/Operating System Concepts, 8th Edition[A4])