**Operating Systems**

**UNIT – I**

**Concepts**

Operation System & its need

Functions of OS

Types of OS

Simple Batch Systems

Multi-programmed Batched Systems

Time-Sharing Systems

Parallel Systems

Distributed Systems

Real-Time Systems

**Operating-System Structures**

System Components

Operating System Services

System Calls

System Structure

Virtual Machines

Process Management

**UNIT – II**

**CPU Scheduling Algorithms**

Basic Concepts

Scheduling Criteria

Scheduling Algorithms

FCFS

SJF

Priority, Round-Robin

Multilevel Queue

Multilevel Feedback Queue

Multiple-Processor Scheduling

**Process Synchronization**

The Critical section problem

Synchronization hardware semaphores

Classical problems of synchronization

Critical regions

System Model

**Deadlocks**

Deadlock Characterization

Methods for Handling Deadlocks

Deadlock Prevention

Deadlock Avoidance

Deadlock Detection

Recovery from Deadlock

**UNIT - III**

**Memory Management**

Background

Logical versus Physical Address space

Swapping

Contiguous allocation (fragmentation)

Segmentation

Virtual Memory

Paging

Demand Paging

Page-replacement

Algorithms (FIFO, Optimal, LRU, Counting)

**File Management**

File Concepts (Operations & Attributes)

Access Methods

Directory Structure

File System Structure

Allocation Methods (Contiguous Allocation, Linked Allocation, Indexed Allocation)

**Device Management**

General device characteristics

Device controllers

Device drivers

Interrupts Driven I/O

Memory Mapped I/O

Direct Memory

**UNIT - IV**

**Introduction to Linux**

Evolution of Linux

Linux Architecture

Linux file system (Inode, Super block, Mounting and Unmounting)

Essential Linux Commands and Shell Scripts (Internal and External Commands)

Kernel Management in Linux

Process Management in Linux