

**RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL**

**New Scheme Based On AICTE Flexible Curricula**

**Computer Science & Information Technology, V-Semester**

**CSIT502 - Operating System**

**Course Objectives**

- Learn concepts of operating systems
- Learn the mechanisms of OS to handle processes
- Study of various mechanisms involved in memory management techniques
- Gaining knowledge of deadlocks prevention and detection techniques
- Analyzing disk management functions and techniques

**Unit I**

Introduction to Operating Systems, Evaluation of OS, Types of operating Systems, system protection, Operating system services, Operating System structure, System Calls and System Boots, Operating System design and implementation, Spooling and Buffering.

**Unit II**

Basic concepts of CPU scheduling, Scheduling criteria, Scheduling algorithms, algorithm evaluation, multiple processor scheduling. Process concept, operations on processes, threads, inter process communication, precedence graphs, critical section problem, semaphores, classical problems of synchronization,

**Unit III**

Deadlock problem, deadlock characterization, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock, Methods for deadlock handling. Concepts of memory management, logical and physical address space, swapping, Fixed and Dynamic Partitions, Best-Fit, First-Fit and Worst Fit Allocation, paging, segmentation, and paging combined with segmentation.

**Unit IV**

Concepts of virtual memory, Cache Memory Organization, demand paging, page replacement algorithms, allocation of frames, thrashing, demand segmentation, Role of Operating System in Security, Security Breaches, System Protection, and Password Management.

**Unit V**

Disk scheduling, file concepts, File manager, File organization, access methods, allocation methods, free space managements, directory systems, file protection, file organization & access mechanism, file sharing implement issue, File Management in Linux, introduction to distributed systems.

### **References:**

1. Silberschatz ,”Operating system”, Willey Pub
2. Tanenbaum “ Modern Operating System” PHI Learning.
3. Dhamdhere, ”System Programming and Operating System”,TMH.
4. Stuart,”Operating System Principles, Design &Applications”,Cengage Learning
5. Operating System : Principle and Design by Pabitra Pal Choudhury, PHI Learning

### **Suggested List of Experiments**

1. Program to implement FCFS CPU scheduling algorithm.
2. Program to implement SJF CPU scheduling algorithm.
3. Program to implement Priority CPU Scheduling algorithm.
4. Program to implement Round Robin CPU scheduling algorithm.
5. Program to implement classical inter process communication problem(producer consumer).
6. Program to implement classical inter process communication problem(Reader Writers).
7. Program to implement classical inter process communication problem(Dining Philosophers).
8. Program to implement FIFO page replacement algorithm.
9. Program to implement LRU page replacement algorithm

### **Course Outcomes**

Upon successful completion of this course the students will:

- Gain knowledge of history of operating systems
- Understand design issues associated with operating systems
- Gain knowledge of various process management concepts including scheduling,synchronization,deadlocks
- Understand concepts of memory management including irtual memory
- Understand issuesrelatedtofilesysteminterfaceandimplementation,diskmanagement
- Be familiar with protection and security mechanisms
- Bef amiliar with various types of operating systems including Unix