IT- 504 – System Programming and operating system

Unit I

Introduction Language Processors, Language Processing Activities and Language Processors Development Tools, Assemblers, Compiler, Macros and Macro Processors, Linkers, Software Tools . Introduction to Operating Systems, Types of operating Systems, system protection, Operating system services.

Unit II

Basic concepts of CPU scheduling, Scheduling criteria, Scheduling algorithms, algorithm evaluation, multiple processor scheduling. Process concept, operations on processes, threads, interprocess 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 Managment.

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

Suggested List of Experiment

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.
10.   Program to implement LFU page replacement.
11.   Program to implement Optimal page replacement.