MCA208: Advanced Operating Systems

Teaching Scheme	Examination Scheme
Lectures: 3 hrs/Week Tutorials: 1 hr/Week Credits: 4	Class Test -12Marks Teachers Assessment - 6Marks Attendance – 12 Marks End Semester Exam – 70 marks

Prerequisite: - Basic Computer Concepts

Course Objectives:

1. Understand the services of an operating system provides to its users and system itself.
2. Apply various CPU scheduling algorithms and recognize the classic synchronization problems
3. Compare methods for handling deadlocks and apply various memory management techniques.
4. Describe file systems.
5. To understand the disk scheduling.
6. Security issues in system

Detailed syllabus:

UNIT I **Introduction:** Definition of operating systems, Computer System architecture: single Processor, Multi-Processor, Clustered Systems. Operating system structure, Dual Mode Operating system Operations, Distributed System, Operating system services, System calls, system programs, Design Goals, Layered Approach.
UNIT II **Process Management:** Process concept, Process scheduling, Cooperating processes, Threads, Inter-process communication, CPU Scheduling: Scheduling Queues, Schedulers, Context Switch, CPU scheduling criteria, Scheduling algorithms, Multiple-processor scheduling.
UNIT III **Process Synchronization and Deadlocks:** The Critical-Section problem, Peterson's solution, Semaphores, Classical problems of synchronization, Critical regions, Deadlocks-System model, Characterization: Necessary Conditions, Resource allocation Graph. Deadlock prevention, Avoidance and Detection, Recovery from deadlock.
UNIT IV **Storage management:** Memory Management-Basic Hardware, Logical and Physical Address Space, Swapping, Fragmentation, Non Contiguous Memory allocation, Contiguous Memory allocation, Paging: Basic concept, allocation algorithm, Relocation, Protection. Segmentation: Basic concept, allocation algorithm, Relocation, Protection. Segmentation with paging, Virtual Memory, Demand paging, Page replacement algorithms, Allocation of frames, Thrashing: Cause of Thrashing, Working set Model.
UNIT V **File concept, access methods, and Directory implementation:** Linear List, Hash Table. Disk structure, Disk scheduling methods, Disk management: Disk Formatting, Boot Block, Bad Block. Interrupt, Direct Memory Access.
UNIT VI **Security & Case Study:** Protection and Security-Goals of protection, Domain of protection, Access matrix, Implementation of access Matrix, The Security problem, Authentication, One Time passwords, Program threats, System threats, Threat Monitoring, Encryption.

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1. Apply the fundamental design paradigms and technologies to mobile computing applications.
2. Demonstrate the different wireless technologies such as CDMA, GSM, and GPRS etc.
3. To design and considerations for deploying the wireless network infrastructure
4. To easily understand and design network architecture
5. Evaluate network protocols, routing algorithms, connectivity methods and characteristics
6. To understand and evaluate CODA File System and Adaptive Clustering for mobile computing

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