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INFORMATION TECHNOLOGY
ENGINEERING

IT ENGINEERING SEM IV

OPERATING SYSTEM

Programming & development

Course Curriculum

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OPERATING SYSTEM SEM IV

Module 1 : Fundamentals of Operating System

- Introduction to Operating Systems
- Operating System Structure and Operations
- Functions of Operating Systems
- Operating System Services and Interface
- System Calls and its Types
- System Programs
- Operating System Structure
- System Boot

Module 2: Process Management

- Basic Concepts of Process
- Operation on Process
- Process State Model and Transition
- Process Control Block
- Context Switching
- Introduction to Threads
- Types of Threads
- Thread Models
- Basic Concepts of Scheduling
- Types of Schedulers
- Scheduling Criteria
- Scheduling Algorithms

Module 3: Process Coordination

- Basic Concepts of Inter-process Communication and Synchronization
- Race Condition
- Critical Region and Problem
- Peterson's Solution
- Synchronization Hardware and Semaphores
- Classic Problems of Synchronization
- Message Passing

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- Introduction to Deadlocks
- System Model
- Deadlock Characterization
- Deadlock Detection and Recovery
- Deadlock Prevention
- Deadlock Avoidance

Module 4: Memory Management

- Basic Concepts of Memory Management
- Swapping
- Contiguous Memory Allocation
- Paging
- Structure of Page Table
- Segmentation
- Basic Concepts of Virtual Memory
- Demand Pagin
- Copy-on Write
- Page Replacement Algorithms
- Thrashing

Module 5: Storage Management

- Basic Concepts of File System
- File Access Methods
- Directory Structure
- File-System Implementation
- Allocation Methods
- Free Space Management
- Overview of Mass-Storage Structure
- Disk Structure
- Disk Scheduling
- RAID Structure
- Introduction to I/O Systems

Module 6: Special-purpose Operating Systems

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- Open-source and Proprietary Operating System
- Fundamentals of Distributed Operating System
- Network Operating System
- Embedded Operating Systems
- Cloud and IoT Operating Systems
- Real-Time Operating System
- Mobile Operating System
- Multimedia Operating System
- Comparison between Functions of various Special-purpose Operating Systems