VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

OPERATING SYSTEMS

B. TECH- III Semester   **L/T/P/C**
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Pre-Requisites: None

Course Objectives:
- ➢ To understand the OS role in the overall computer system
- ➢ To study the operations performed by OS as a resource manager
- ➢ To understand the scheduling policies of OS and process concurrency and synchronization
- ➢ To understand the different memory management techniques
- ➢ To understand the goals and principles of protection

UNIT - I
Overview-Introduction-Operating system objectives, User view, System view, Operating system definition, Computer System Organization, Computer System Architecture, OS Structure, OS Operations, Process Management, Memory Management, Storage Management, Protection and Security, Special Purpose Systems, Computing Environments.

System Structures- Operating System services, User and OS Interface, System Calls, Types of System Calls, System Programs, Operating System Design and Implementation, OS Structure.

UNIT - II
Process Concept- Process Concept, Process Scheduling, Inter process Communication, Multithreading Models. **Process Scheduling-** Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Algorithm Evaluation. **Synchronization-** Background, The Critical-Section Problem, Peterson's Solution, Synchronization Hardware, Mutex Locks, Semaphores, Classic Problems of Synchronization, Monitors.

UNIT – III
Memory-Management Strategies - Background, Swapping, Contiguous Memory Allocation, Segmentation, Paging, Structure of the Page Table.

Virtual-Memory Management- Demand Paging, Copy-on-Write, Page Replacement, Thrashing.

UNIT – IV
Deadlocks-System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, and Recovery from Deadlock.

File System -File Concept, Access Methods, Directory and Disk Structure, Protection.

Implementing File-Systems - File-System Structure, File-System Implementation, Directory Implementation, Allocation Methods, Free-Space Management.

UNIT – V
Mass Storage Structure – Overview of Mass Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling, Disk Management, RAID structure, Swap space Management.

Protection – System Protection, Goals of Protection, Principles of Protection, Domain of Protection, Access Matrix, Implementation of Access Matrix, Access Control, Revocation of

Access Rights, Capability-Based Systems, Language-Based Protection.

Course Outcomes:
After the completion of this course, the students should be able to

    CO-1: Compare various Operating Systems architectures, IO structures, Network Structure

    CO-2: Analyze the virtual memory, paging and memory allocation techniques for various
           applications.