



**BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE**  
(An AUTONOMOUS INSTITUTION, APPROVED BY AICTE-NEW DELHI, PERMANENTLY  
AFFILIATED TO JNTUK-KAKINADA, ACCREDITED BY NAAC 'A' GRADE,  
2 PROGRAMMES (CSE,EEE) ACCREDITED BY NBA ( For A.Y 2023-24 to 2025-26)  
Post Box: 26, Amalapuram 533201, Dr.B R Ambedkar Konaseema Dt., A.P.

### BR23-CSE II YEAR II SEMESTER SYLLABUS

II Year II Semester

**OPERATING SYSTEMS (23CS4T04)**

(Common to CSE, IT, CSE-(AI & DS))

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**Course Objectives:**

The main objectives of the course is to make student

- Understand the basic concepts and principles of operating systems, including processmanagement, memory management, file systems, and Protection
- Make use of process scheduling algorithms and synchronization techniques to achievebetter performance of a computer system.
- Illustrate different conditions for deadlock and their possible solutions.

**Course Outcomes**

- Outline the basic concepts and principles of operating systems (UNDERSTAND)
- Apply various process scheduling algorithms to achieve better performance of a computer system (APPLY)
- Make use of synchronization techniques to maintain the consistency and enhance the system efficiency (APPLY)
- Analyze different page replacement methods to achieve efficient utilization of computer memory(ANALYZE)
- Explore File management techniques to organize and manage files on storage device (ANALYZE)

#### UNIT - I

Operating Systems Overview: Introduction, Operating system functions, Operating systems operations, Computing environments, Free and Open-Source Operating Systems

System Structures: Operating System Services, User and Operating-System Interface, system calls, Types of System Calls, system programs, Operating system Design and

				H. L. Haridha	
Dr.N.Rama Krishnaiah, Professor of CSE,UCEK & Control of Examination JNTUK, kakinada.	Dr.C.Krishna Mohan, Professor of CSE,IIT, Kandi, Hyderabad.	Dr.P.Radha Krishna, Professor of CSE,NIT, Warangal	Mr.Rajesh Bobburi Chief Operating Officer, HighQ Labs Private Limited, Rajahmundry	Dr.Lakshmi Haritha Medida, Associate Professor, R.M.K.Engineering College,Kavaraipettai ,Tamilnadu	Dr.K.Sriniva Professor & HoD Department CSE, B.V.C.I.T.S. Batlapalem



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Implementation, Operating system structure, Building and Booting an Operating System,  
Operating system debugging

#### UNIT - II

Processes: Process Concept, Process scheduling, Operations on processes, Inter-process communication.

Threads and Concurrency: Multithreading models, Thread libraries, Threading issues.

CPU Scheduling: Basic concepts, Scheduling criteria, Scheduling algorithms, Multiple processor scheduling.

#### UNIT - III

Synchronization Tools: The Critical Section Problem, Peterson's Solution, Mutex Locks, Semaphores, Monitors, Classic problems of Synchronization.

Deadlocks: system Model, Deadlock characterization, Methods for handling Deadlocks, Deadlock prevention, Deadlock avoidance, Deadlock detection, Recovery from Deadlock.

#### UNIT - IV

Memory-Management Strategies: Introduction, Contiguous memory allocation, Paging, Structure of the Page Table, Swapping.

Virtual Memory Management: Introduction, Demand paging, Copy-on-write, Page replacement, Allocation of frames, Thrashing

Storage Management: Overview of Mass Storage Structure, HDD Scheduling.

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### UNIT - V

File System: File System Interface: File concept, Access methods, Directory Structure;  
File system Implementation: File-system structure, File-system Operations, Directory  
implementation, Allocation method, Free space management; File-System Internals:File-  
System Mounting, Partitions and Mounting, File Sharing.

Protection: Goals of protection, Principles of protection, Protection Rings, Domain of  
protection, Access matrix.

#### Text Books:

1. Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10<sup>th</sup> Edition, Wiley, 2018.
2. Modern Operating Systems, Tanenbaum A S, 4<sup>th</sup> Edition, Pearson , 2016

#### Reference Books:

1. Operating Systems -Internals and Design Principles, Stallings W, 9<sup>th</sup> edition, Pearson,2018
2. Operating Systems: A Concept Based Approach, D.M Dhamdhere, 3<sup>rd</sup> Edition, McGraw- Hill, 2013

#### Online Learning Resources:

1. <https://nptel.ac.in/courses/106/106/106106144/>
2. <http://peterindia.net/OperatingSystems.html>

				M. L. Haritha	
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