



**BONAM VENKATA CHALAMAYYA INSTITUTE OF
TECHNOLOGY AND SCIENCE (A) :: BATLAPALEM, Andhra
Pradesh, India**

**MCA Course Structure & Syllabus
(Applicable for batches admitted from 2025-2026)**

MCA-II Semester
Course code : 25MC2E02

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ADVANCED UNIX PROGRAMMING

Course Objectives:

To understand the fundamental design of the unix Programming

- To become fluent with the systems calls provided in the unix environment
- To be able to design and build an application/service over the unix operating system

UNIT-I:

Review of Unix Utilities and Shell Programming:-File handling utilities, security by file permissions, process utilities, disk utilities, networking commands, backup utilities, text processing utilities. Shell Programming: shell, shell responsibilities, pipes and input redirection, output redirection, here documents, the shell as a programming language, shell meta characters, shell variables, shell commands, the environment, control structures, shell script examples.

UNIT-II:

Unix Files: Unix file structure, directories, files and devices, System calls, library functions, low level file access, usage of open, create, read, write, close, lseek, stat, fstat, octl, umask, dup, dup2, Differences between system call and library functions. File and directory maintenance: chmod, chown, unlink, link, symlink, mkdir, rmdir, chdir, getcwd. Directory handling system calls: opendir, readdir, closedir, rewinddir, seekdir, telldir

UNIT-III:

Unix Process: Threads and Signals: process, process structure, starting new process, waiting for a process, zombie process, orphan process, process control, process identifiers, system call interface for process management, - fork, vfork, exit, wait, waitpid, exec, system. Signals: Signal functions, unreliable signals, interrupted system calls, kill and raise functions, alarm, pause functions, abort, sleep functions

UNIT-IV:

Inter process Communication: Introduction to IPC, IPC between processes on a single computer system, IPC between processes on different systems, pipes, FIFOs, message queues, semaphores and shared memory. Differences between pipes and FIFOs. Implementing a client server program using pipes and FIFOs. Message Queues:-IPC, permission issues, Access permission modes, message structure, working with message queues, client/server example. Semaphores: Creating semaphore sets, Unix kernel support for semaphores, Unix APIs for semaphores, file locking using semaphores.

UNIT-V

Shared Memory: Working with shared memory segments, Unix kernel support for shared memory, client/server example. Sockets: Berkeley sockets, socket structure, socket system calls for connection oriented protocol and connectionless protocol, implementing client server programs using TCP and UDP sockets.

University Nominee Dr.Suneetha Eluri		Alumni Member Mr.HariSuresh Poliseti	
SubjectExpert:1 Dr. B Kezia Rani		Chairman Mr. AVS M Ganesh	
SubjectExpert:2 Dr.SuneelKumarDuvvuri		Member Mr. G L N V S Kumar	
Representative From Industry Mr.SaiKrishna Narima		Member	



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Text Books:

1. Advanced programming in the unix environment, w- Richard Stevens, 2nd Edition Pearson education
2. Unix Concepts and Applications, 3/e, Sumitabha Das, TMH

Reference Books:

1. Unix and shell Programming, Sumitabha Das, TMH
2. A Beginner's Guide to Unix, N.P.Gopalan, B.SivaSelva, PHI
3. Unix Shell Programming, Stephen G.Kochan, Patrick Wood,
4. Unix Shell Programming, Lowell Jay Arthus& Ted Burns,3/e,GalGotia

Web Resources:

1. <https://archive.nptel.ac.in/courses/117/106/117106113/>
2. <https://stevens.netmeister.org/631/>
3. <https://www.cs.fsu.edu/~asriniva/courses/aup02/lectures.html>

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