

MC203 UNIX PROGRAMMING

Objectives of the Course:

The course will enable students to

- *Effectively use Unix and C to write, test, debug, and maintain modest-sized programs,*
- *Design, build, and use the software tools that fit well into Unix, writing such tools both in the Bourne Shell and in C, using Unix arguments and standard input and output facilities,*
- *Design modest-sized program using independent modules (abstract data types Hrs), that offer some potential for reuse,*
- *Clearly explain the principles behind Unix concepts such as the file system structure, pipelines, file permissions, and environments,*
- *Use standard C libraries and their associated header files effectively in writing programs.*

UNIT - I

(12 Hrs)

Unix Utilities: Introduction to UNIX file system, file handling utilities, security by file permissions, vi editor, process utilities, disk utilities, networking commands, cp, mv, ln, rm, unlink, mkdir, rmdir, du, df, mount, umount, find, umask, ulimit, ps, who, w, finger, arp, ftp, telnet, rlogin.

UNIT - II

(12 Hrs)

Unix Utilities: Text processing utilities and backup utilities detailed commands to be covered are: cat, tail, head, sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, more, pg, comm., cmp, diff, tr, awk, tar. What is a shell, shell responsibilities, pipes and input redirection, output redirection, shell variables, conditions, history and control structures and shell programming.

UNIT - III

(12 Hrs)

File I/O: File descriptor, open function, close function, creat function, lseek, read, write, File sharing, dup and dup2 functions, fcntl, ioctl functions.

Files and Directories: File status, stat, fstat, lstat Functions, File types, Permission, ownership of new files and Directories, File system, Links, File times, Directory related functions. The System calls to be covered are access, umask, chmod, fchmod, chown, link, unlink, symlink, mkdir, rmdir, chdir, fchdir, getcwd, utime.

Standard I/O Library: Streams, Buffering, open, read & write on streams, Binary I/O, Formatted I/O Temporary Files (fopen, fread, fclose, fflush, fseek, fgetc, getc, getchar, fputc, putchar).

UNIT - IV

(12 Hrs)

Environment of Unix Process: Process invocation and termination, Environment variables & List, Memory Layout of C program & memory management routines.

Process control: Process identifiers, fork, vfork, exit, wait, waitpid, wait3, exec Functions. Race conditions, Zombie process.

Signals: Signal Concepts, Signal handling, Important signals: kill, raise, alarm, pause, and abort.

UNIT - V

(12 Hrs)

Advanced I/O: Record Locking , Streams, I/O Multiplexing, Memory Mapped I/O, various Read and write

Inter Process Communication: Pipes, FIFO, System V IPC (Message Queue, Semaphore, Shared Memory Hrs).

Text Books:

1. Unix and shell Programming Behrouz A. Forouzan, Richard F. Gilberg. Thomson
2. Sumitabha Das - Unix: Concepts & Applications 4/e - TMH.
3. Advanced Programming in the UNIX environment W.R.Stevens

Reference Books:

1. Unix internals, the new frontiers Uresh vahalia.
2. The C Odyssey UNIX Meeta Gandhi