VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

M.C.A. (5 th Semester)

Proposed Syllabus

Paper : 502 : UNIX Internals and Shell Programming

Effective From June 2011

1. Introduction
    - 1.1 Features of UNIX
    - 1.2 System Structures
    - 1.3 Shell and Its Features
    - 1.4 Kernal
        - 1.4.1 Architecture of the UNIX OS
        - 1.4.2 Kernal Data Structures
2. Overview
    - 2.1 Logging in & out
    - 2.2 Inode & File Structure
    - 2.3 File System Structure & Features
    - 2.4 Booting Sequence & Iinit process
    - 2.5 File Access Permission
3. Shell Programming
    - 3.1 Environment & User defined Variables
    - 3.2 Argument processing
    - 3.3 Shell's Interpretation at prompt
    - 3.4 Arithmetic Expression Evaluation
    - 3.5 Control Structures
    - 3.6 Redirection
    - 3.7 Background Process & Priorities of Process
    - 3.8 Conditional Execution
    - 3.9 Parameter & quote substitution
    - 3.10 Command Evaluation & Command Grouping
    - 3.11 Trapping Signals
4. Advanced Shell Programming
    - 4.1 Filtering Utilities – sed
    - 2 awk
    - 4.3 Batch Processes
    - 4.4 Splitting, Comparing, Sorting, Merging and Ordering Files
    - 4.5 Terminals Handling
    - 4.6 Communication with Other Users
    - 4.7 Spooling and Print Management
    - 4.8 Backup and Recovery
    - 4.9 Remote Login, File Transfer & sharing
5. File System and Internal Representation
    - 5.1 Structure of Buffer Pool
    - 5.2 Superblock
    - 5.3 Inode assignment to file
    - 5.4 Reading, writing and allocation of disk blocks

5.5 System calls for File System

6. Process Management
    - 6.1 Status and Transitions
    - 6.2 Context and manipulation of process address space
    - 6.3 Process creation and termination
    - 6.4 Process scheduling
    - 6.5 System calls for process management
    - 6.6 Interposes Communication
7. Memory Management
    - 7.1 Swapping
    - 7.2 Demand Paging
    - 7.3 System Calls for memory management
    - 7.4 Solution with semaphore
8. The I/O subsystem
    - 8.1 Driver interface
    - 8.2 Disk and terminal drivers
    - 8.3 Streams

Reference Books

1. M.J. Buch : The Design of UNIX OS , Preitice Hall
2. Eric Foxley : UNIX for Super-Users, Addition Wesley
3. Brian W. Kernighan, Pike : The UNIX Programming Environment, Prentice Hall of India
4. W. Richard Stevens, Bill Fenner, Andrew M. Rudoff : UNIX Network Programming , The Socket Networking API Vol. 1 , Prentice Hall of India
5. W. Richard Stevens,: UNIX Network Programming , Interposes Communication Networking API Vol.2., Prentice Hall of India
6. N. Kutti : C and UNIX Programming : Tata Macgraw Hill
7. Vijay Mukhi : UNIX Shells – Bourne, Korn & C, PBP Publication