UNIX SYSTEMS PROGRAMMING

Subject   Code

:

| | **06CS62** |

IA   Marks

:

25

No.   of Lecture Hrs./Week

:

04

Exam   Hours

:

03

Total   No. of Lecture Hrs.

:

52

Exam   Marks

:

100

PART - A

UNIT - 1

INTRODUCTION: UNIX and ANSI Standards: The ANSI C Standard, The ANSI/ISO C++ Standards, Difference between ANSI C and C++, The POSIX Standards, The POSIX.1 FIPS Standard, The X/Open Standards. UNIX and POSIX APIs: The POSIX APIs, The UNIX and POSIX Development Environment, API Common Characteristics.

   6 Hours

UNIT - 2

UNIX FILES: File Types, The UNIX and POSIX File System, The UNIX and POSIX File Attributes, Inodes in UNIX System V, Application Program Interface to Files, UNIX Kernel Support for Files, Relationship of C Stream Pointers and File Descriptors, Directory Files, Hard and Symbolic Links.

6 Hours

UNIT - 3 □□□

UNIX File APIs: General File APIs, File and Record Locking, Directory File APIs, Device File APIs, FIFO File APIs, Symbolic Link File APIs, General File Class, regfile Class for Regular Files, dirfile Class for Directory Files, FIFO File Class, Device File Class, Symbolic Link File Class, File Listing Program.

7 Hours

UNIT - 4

UNIX PROCESSES: The Environment of a UNIX Process: Introduction, main function, Process Termination, Command-Line Arguments, Environment List, Memory Layout of a C Program, Shared Libraries, Memory Allocation, Environment Variables, setjmp and longjmp Functions, getrlimit, setrlimit Functions, UNIX Kernel Support for Processes.

7 Hours

PART - B

UNIT - 5

PROCESS CONTROL: Introduction, Process Identifiers, fork, vfork, exit, wait, waitpid, waited, wait3, wait4 Functions, Race Conditions, exec Functions, Changing User IDs and Group IDs, Interpreter Files, system Function, Process Accounting, User Identification, Process Times.
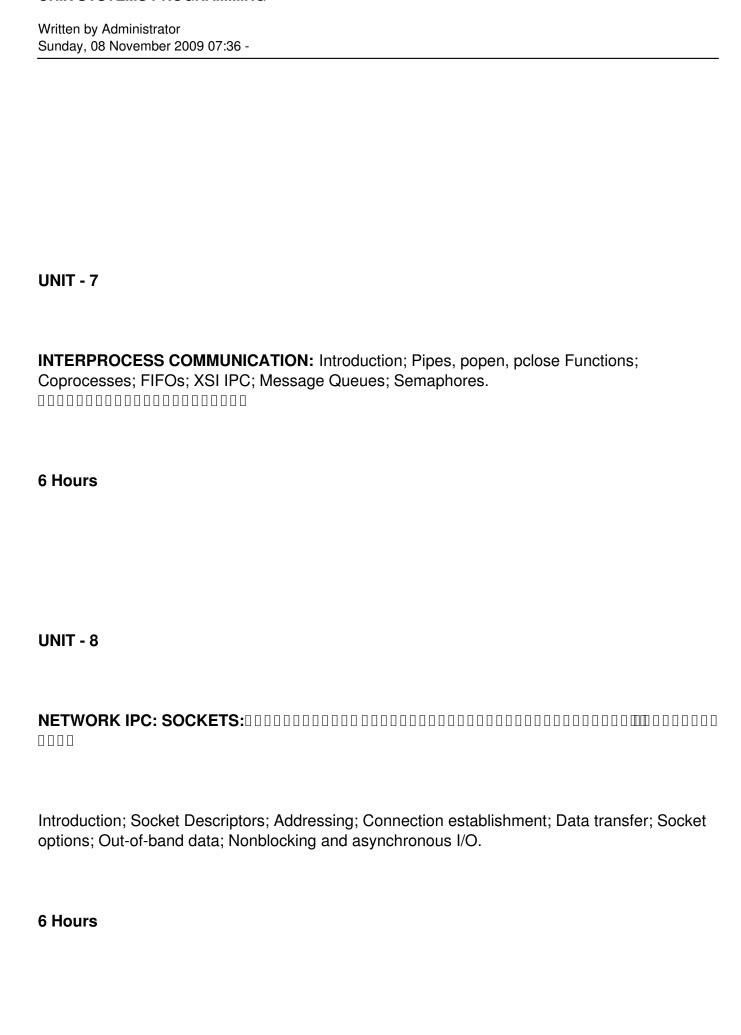
Process Relationships: Introduction, Terminal Logins, Network Logins, Process Groups, Sessions, Controlling Terminal, tcgetpgrp, tcsetpgrp, and tcgetsid Functions, Job Control, Shell Execution of Programs, Orphaned Process Groups.

7 Hours

UNIT - 6

SIGNALS AND DAEMON PROCESSES: Signals: The UNIX Kernel Support for Signals, signal, Signal Mask, sigaction, The SIGCHLD Signal and the waitpid Function, The sigsetjmp and siglongjmp Functions, Kill, Alarm, Interval Timers, POSIX.lb Timers. Daemon Processes: Introduction, Daemon Characteristics, Coding Rules, Error Logging, Single-instance daemons; Daemon conventions; Client-Server Model.

7 Hours

UNIT - 7

INTERPROCESS COMMUNICATION: Introduction; Pipes, popen, pclose Functions; Coprocesses; FIFOs; XSI IPC; Message Queues; Semaphores.

6 Hours

UNIT - 8

NETWORK IPC: SOCKETS:

Introduction; Socket Descriptors; Addressing; Connection establishment; Data transfer; Socket options; Out-of-band data; Nonblocking and asynchronous I/O.

6 Hours

TEXT BOOKS:

1. **Unix System Programming Using C++** – Terrence Chan - Prentice Hall India, 1999.

2. **Stephen A. Rago: Advanced Programming in the UNIX Environment** – W.Richard Stevens, 2nd Edition, Pearson Education / PHI, 2005.

REFERENCE BOOKS:

1. **Advanced Unix Programming** – Marc J. Rochkind:, 2nd Edition, Pearson Education, 2005.
2. **The Design of the UNIX Operating System** – Maurice.J.Bach:, Pearson Education / PHI, 1987.
3. **Unix Internals** – Uresh Vahalia:, Pearson Education, 2001.