UNIX & Shell Programming

Session 1: General Overview of the System

1. System structure, user perspective, O/S services assumption about Hardware The Kernel and buffer cache architecture of Unix O/S.
2. System concepts, Kernel data Structure, System administration, Buffer headers.
3. Structure of the buffer pool, Scenarios for retrieval of the buffer.
4. Reading and writing disk block, Advantage and disadvantage of buffer cache.

Session 2: Internal representation of Files and System calls

1. **INODES**: Structure of regular, Directories conversions of a path name to an inode, Super block, Inode assignment to a new file, Allocation of disk blocks.
2. **System Calls for the System:** Open read write file and record close, File creation, Operation of special files change directory and change root.
3. Change owner and change mode, STAT and FSTAT, PIPES mounting and unmounting files system, Link Unlink.

Session 3: Structures of Processes and Process Control

1. Process states and transitions layout of system memory, the context of a process, manipulation of process address space.
2. Sleep process creation/termination.
3. The user Id of a process, changing the size of a process.
4. The SHELL **Interprocess Communication and multiprocessor system**: Process tracing system V IPO network communication.
5. Sockets problem of multiprocessors systems, solution with master and hare process, and solution with semaphores.

Session 4: Introduction of Shell Script

1. Shell Bourne shell.
2. C shell, UNIX commands, permissions, editors.
3. Filters sed, grep family, shell variables, scripts.
4. Meta characters and environment, if and case statements, for while and until loops.
5. Shell programming.

Session 5: Awk and Perl Programming

1. Awk pattern scanning and processing language BEGIN and END patterns.
2. Awk arithmetic and variables, Awk built in variable names and operators, arrays, strings, functions.
3. Perl: the chop() function, variable and operators, $_ and $. , Lists, arrays, regular expression and substitution, file handling, subroutines, formatted printing.
4. **Linux:** History & Features of Linux, Linux structure, various flavours of linux.

Book References

1. M.J. Bach “Design of UNIX O.S. “, Prentice Hall of India.
2. Y.Kanetkar “Unix shell programming”, BPB Pub.
3. S. Prata “Advanced UNIX: A Programming's Guide”, BPB Publications, New Delhi.
4. Linux Kernel, Beck Pearson Education, Asia.