

NIRMA UNIVERSITY
Institute of Technology
B. Tech. Computer Science and Engineering
Semester –VI
Department Elective-III

L	T	P	C
2	0	2	3

Course Code	2CSDE74
Course Title	Design of Operating Systems

Course Outcomes:

At the end of the course, students will be able to -

1. describe the various components of Operating Systems.
2. analyze the different services provided by UNIX Operating System.
3. design and implement various system calls and concurrent processes requiring synchronization.

Syllabus:

**Teaching
Hours:30
04**

Unit I

Introduction to the Kernel: Architecture of the Unix operating system, Introduction to the system concepts, Kernel data structures system administration.

Unit II

Internal Representation of Files: Inodes, Structure of a regular file, Directories, conversion of a path name to an inode, Super block, inode assignment to a new file, Allocation of disk blocks, Other file types.

Unit III

System Calls for the File System: Open, read, write, file and record locking, Adjusting the position of file I/O, lseek, close, file creation, creation of, special files, change directory and change root, change owner and change mode, stat and fstat, pipes, dup, mounting and unmounting file systems, link, unlink, file system maintenance.

Unit IV

The Structure of Processes: Process states and transitions, Layout of system memory, the context of a process, saving the context of a process, manipulation of the process address space, sleep.

Unit V

Process Control: Process creation, signals, process termination, Awaiting process termination.

Self-Study:

The self-study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self-study contents.



Laboratory Work:

Laboratory work will be based on the above syllabus with minimum 5 experiments to be incorporated.

Suggested Readings[^]:

1. The Design of the Unix Operating System, Maurice J. Bach, Prentice Hall of India.
2. The Unix programming Environment, Brian W. Kernighan and Rob Pike.
3. Advanced Programming in the UNIX Environment, Richard Stevens, Addison-Wesley.
4. Modern Operating System, Andrew Tanenbaum, Prentice Hall of India
5. Guide to Assembly Language Programming in Linux, Sivarama P. Dandamudi, Springer.
6. Linux System Programming, Robert Love, O'Reilly.

L=Lecture, T=Tutorial, P=Practical, C=Credit

[^]this is not an exhaustive list