Guidelines of B.Sc. (H) Computer Science Sem III

(NEP) Operating System (DSC 08) Core Course

S.No.	Unit	Chapter(s)	Suggested Number of Weeks
1	**Introduction**	1.1, 1.4, 1.5, 1.6, 1.7, 1.8	2
2	**Operating System Structures**	2.1, 2.3, 2.4, 2.5, 2.7 – 2.7.4	2
3	**Process Management**	3.1, 3.2, 3.3 (excluding process creationusing Windows API figure 3.11) 4.1, 4.2, 4.3, 4.4 – 4.4.1 5.1, 5.2, 5.3 – 5.3.4 6.1, 6.2, 6.3 7.1, 7.2, 7.3	5
4	**Memory Management**	8.1.3, 8.2, 8.3, 8.4, 8.5-8.5.2 9.2, 9.4 – 9.4.4	4
5	**File System**	10.1 –10.1.2, 10.2, 10.3 –10.3.6 12.1, 12.4	2

Reference Book

Silberschatz, A., Galvin, P. B., Gagne G. Operating System Concepts, 9th edition, John Wiley Publications, 2016.

Additional Resources

1. Dhamdhere, D. M., Operating Systems: A Concept-based Approach, 2nd edition, Tata McGraw-Hill Education, 2017.
2. Kernighan, B. W., Rob Pike, R. The Unix Programming Environment, Englewood Cliffs, NJ: Prentice-Hall, 1984.
3. Stallings, W. Operating Systems: Internals and Design Principles, 9th edition, Pearson Education, 2018.
4. Tanenbaum, A. S. Modern Operating Systems, 3rd edition, Pearson Education, 2007.

Suggested Practical List for the Operating System Paper (DSC08)

1. Execute various LINUX commands for:
    i. Information Maintenance: wc, clear, cal, who, date, pwd
    ii. File Management: cat, cp, rm, mv, cmp, comm, diff, find, grep, awk
    iii. Directory Management: cd, mkdir, rmdir, ls
2. Execute various LINUX commands for:
    i. Process Control: fork, getpid, ps, kill, sleep
    ii. Communication: Input-output redirection, Pipe
    iii. Protection Management: chmod, chown, chgrp
3. Write a program (using fork () and/or exec () commands) where parent and child execute:
    i. same program, same code.
    ii. same program, different code.
    iii. before terminating, the parent waits for the child to finish its task.
4. Write a program to report behaviour of Linux kernel including kernel version, CPU type and CPU information.
5. Write a program to report behaviour of Linux kernel including information on configured memory, amount of free and used memory. (Memory information)
6. Write a program to copy files using system calls.
7. Write a program to implement FCFS scheduling algorithm.
8. Write a program to implement SJF scheduling algorithm.
9. Write a program to implement non-preemptive priority-based scheduling algorithm.
10. Write a program to implement SRTF scheduling algorithm.
11. Write a program to calculate sum of n numbers using Pthreads. A list of n numbers is divided into two smaller list of equal size, two separate threads are used to sum the sub lists.
12. Write a program to implement first-fit, best-fit and worst-fit allocation strategies.