

**Guidelines of B.Sc. (H) Computer Science III Semester / B.Sc. Programme IV Semester/
B.A. Programme IV Semester/ Generic Elective V Semester (NEP UGCF 2022)**

Operating Systems

DSC08/DSC04/GE 5a

(Effective from Academic Year 2024-25)

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 creation using 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. Demonstration of various Operating System functions using OS Simulator.
2. 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
3. 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
4. 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.
5. Write a program to report behaviour of Linux kernel including kernel version, CPU type andCPU information.
6. Write a program to report behaviour of Linux kernel including information on configured memory, amount of free and used memory. (Memory information)
7. Write a program to copy files using system calls.
8. Write a program to implement First Come First Serve (FCFS) scheduling algorithm.
9. Write a program to implement Shortest Job First (SJF) scheduling algorithm.
10. Write a program to implement non-preemptive priority-based scheduling algorithm.
11. Write a program to calculate sum of n numbers using Pthreads.
12. Write a program to implement first-fit, best-fit and worst-fit allocation strategies.