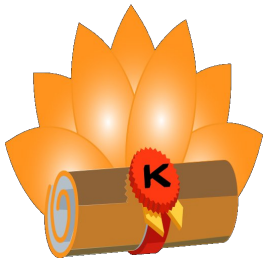
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Operating Systems — Complete Syllabus

BTEUP Diploma in Information Technology • 3rd Semester • Session 2026–27

Subject 3.1 (Theory) • Total 100 Marks • 3 Credits • L 3 – P 0

About this document Operating Systems is subject 3.1 of the 3rd semester of the Diploma in Information Technology. This document gives the complete unit-wise syllabus, the examination scheme, the course outcomes and the reference books from the official curriculum.

Examination Scheme

Code	Paper	Type	L – P	Credits	Internal	External	Total
3.1	Operating Systems	Theory	3 – 0	3	Theory 40	Theory 60 (3 hrs)	100
Operating Systems Total				**3**	**40**	**60**	**100**

What This Subject Aims To Do

A general introduction to various ideas in implementation of operating systems, particularly introduction to various options available so as to develop capacity to compare, contrast, and evaluate the key trade-offs between different design choices.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks (%)
1	Overview of Operating System	6	14
2	Process Management	10	25

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3	Memory Management	10	25
4	I/O System	8	18
5	File management	8	18

Total: 42 periods, 100%. The percentages are the suggested distribution of marks in the official syllabus, out of the 60-mark external theory paper. Units 2 and 3 together carry half the paper.

Unit 1 — Overview of Operating System (6 Periods, 14%)

Topics: Introduction, different types of OS, functions and services of OS, UNIX/LINUX architecture, kernel, services and system calls, system programs.

In simple words: What an operating system is and what it does for you — the types of OS, the kernel at the centre, and the system calls through which programs ask the OS for work.

Unit 2 — Process Management (10 Periods, 25%)

Topics: Process concepts, operations on processes, CPU scheduling, scheduling algorithms, IPC, process synchronization, critical section, deadlock, condition, avoidance and prevention.

In simple words: How the OS runs many programs at once — processes, the CPU scheduling algorithms that share the processor, and deadlock: what it is and how it is avoided or prevented.

Unit 3 — Memory Management (10 Periods, 25%)

Topics: Memory allocation, First Fit, Best Fit and Worst Fit, swapping, paging and segmentation, page faults, page replacement algorithm, fragmentation and compaction, concept of virtual memory.

In simple words: How the OS shares memory between programs — allocation strategies, paging and segmentation, what happens on a page fault, and virtual memory, which lets programs use more memory than the machine has.

Unit 4 — I/O System (8 Periods, 18%)

Topics: Mass storage structure — overview, disk structure, disk attachment, disk scheduling algorithms, swap space management, RAID types.

In simple words: How the OS talks to disks — disk structure, the scheduling algorithms that decide the order of disk requests, swap space, and RAID, which combines disks for speed or safety.

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Unit 5 — File management (8 Periods, 18%)

Topics: Concept of a file, access methods, directory structure, file system mounting, file sharing and protection, file system structure and implementation, directory implementation, free-space management, efficiency and performance. Different types of file systems.

In simple words: How files are stored, found and shared — access methods, directory structures, mounting, protection, and how the OS keeps track of free space on the disk.

Course Outcomes

- CO1: Understand functional architecture of an operating system.
- CO2: Understand process management and distinguish CPU scheduling algorithms.
- CO3: Understand the concept of memory management.
- CO4: Understand I/O System and distinguish Disk scheduling algorithms.
- CO5: Classify File System and directory implementations.

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Source: BTEUP IRDT Kanpur NEP-2020 curriculum for Diploma in Information Technology, effective session 2026-27 (urise.up.gov.in). Topic lists follow the official syllabus; short explanations are the author's own plain-English summaries, not syllabus text. Please confirm with your own polytechnic for any local changes.