

**Guru Daksh Govt. Polytechnic, Hisar**  
**Lesson Plan – Theory**  
Operating Systems | Odd Semester 2026-27

|                           |                                     |
|---------------------------|-------------------------------------|
| <b>Programme Name</b>     | Diploma in Computer Engineering     |
| <b>Semester / Session</b> | III Semester / Odd Semester 2026-27 |
| <b>Course Code / Name</b> | Operating Systems                   |
| <b>Faculty Name</b>       | Ms. Raj Bala / Sh. Rajesh Kumar     |
| <b>Department</b>         | Computer Engineering                |
| <b>Teaching Period</b>    | 15 Weeks                            |
| <b>Weekly Load</b>        | 3 Theory periods/week               |

### 1. Course Outcomes

- CO1: Explain various types and services of the operating system.
- CO2: Categorize different types of schedulers and scheduling algorithms.
- CO3: Define deadlock and the various ways to recover from deadlock.
- CO4: Describe memory management and virtual memory.
- CO5: Practice general commands, filters, shell scripts in Linux..

### 2. Unit-wise Planned Theory Periods

| Unit                                                   | Major Coverage                                                                                                                                                                                                                            | CO       | Planned Periods |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------|
| Unit I – Overview of Operating Systems                 | Definition; types; services; user interface; system calls; system programs; OS structure; virtual machine.                                                                                                                                | CO1      | Approx. 8       |
| Unit II – Process Management and Deadlocks             | Process concept/state/PCB; scheduling queues and schedulers; context switch; process operations; IPC; CPU scheduling; FCFS, SJF, RR; multiprocessor scheduling; synchronization; deadlock, prevention, avoidance, detection and recovery. | CO2, CO3 | Approx. 13      |
| Unit III – Memory Management Function                  | Logical/physical address space; swapping; memory allocation; fixed/variable partitions; fragmentation; compaction; paging; page allocation; hardware support; protection/sharing; segmentation; virtual memory.                           | CO4      | Approx. 8       |
| Unit IV – I/O Management Functions and File Management | Dedicated/shared devices; I/O and storage devices; buffering; spooling; simple/basic/logical/physical file systems; disk-space allocation methods.                                                                                        | CO1, CO4 | Approx. 6       |
| Unit V – Linux Operating System                        | Linux/Unix history and overview; structure/releases; requirements; Linux commands and filters; shell concepts; options; I/O redirection; pipes; standard errors; shell scripts; vi commands.                                              | CO5      | Approx. 10      |

### 4. Week-wise Theory Teaching Schedule

| Week   | Theory Topic / Coverage                                                                  | CO  | Teaching–Learning Method                | Continuous Assessment         |
|--------|------------------------------------------------------------------------------------------|-----|-----------------------------------------|-------------------------------|
| Week 1 | Unit I: OS definition, objectives, types, services and user interface.                   | CO1 | Interactive lecture, board diagrams/ppt | Attendance + oral questioning |
| Week 2 | Unit I: system calls/types, system programs, OS structure, virtual machine and benefits. | CO1 | Lecture+ questioning                    | Notebook checking             |

|         |                                                                                                    |               |                                               |                                                          |
|---------|----------------------------------------------------------------------------------------------------|---------------|-----------------------------------------------|----------------------------------------------------------|
| Week 3  | Unit II: process concept, states, PCB, scheduling queues, job/process scheduler, context switch.   | CO2           | Process-state diagram + discussion            | Concept questions                                        |
| Week 4  | Unit II: process operations, IPC, shared memory, message passing, CPU scheduler and criteria.      | CO2           | Lecture + worked examples                     | Assignment                                               |
| Week 5  | Unit II: preemptive/non-preemptive scheduling; FCFS and SJF with numerical problems.               | CO2           | Worked problems + peer solving                | Class exercise checking                                  |
| Week 6  | Unit II: Round Robin, multiprocessor scheduling, process synchronization.                          | CO2           | Gantt-chart problems + discussion             | Quiz/Class Test                                          |
| Week 7  | Unit II: deadlock, necessary conditions, handling methods and prevention.                          | CO3           | Case study + resource-allocation diagrams     | Sessional Test – as per HSBTE                            |
| Week 8  | Unit II: deadlock avoidance, detection and recovery; unit revision.                                | CO3           | Problem solving + remedial teaching           | Assignment                                               |
| Week 9  | Unit III: logical/physical address space, swapping, memory allocation, fixed/variable partitions.  | CO4           | Lecture + memory maps                         | Notebook checking                                        |
| Week 10 | Unit III: fragmentation, compaction, paging, page allocation and hardware support.                 | CO4           | Diagrams + worked examples                    | Assignment –                                             |
| Week 11 | Unit III: protection/sharing, disadvantages of paging, segmentation, virtual memory.               | CO4           | Comparison charts + discussion                | Sessional Test – as per HSBTE                            |
| Week 12 | Unit IV: dedicated/shared devices, I/O/storage devices, buffering and spooling.                    | CO1, CO4      | Block diagrams + examples                     | Quiz/Class Test                                          |
| Week 13 | Unit IV: file systems and disk-space allocation; Unit V introduction and Linux overview.           | CO1, CO4, CO5 | Lecture + demonstrations                      | notebook checking                                        |
| Week 14 | Unit V: Linux commands and filters; communication commands; shell concepts; redirection and pipes. | CO5           | Live terminal demonstration + guided practice | Quiz/Class Test                                          |
| Week 15 | Unit V: shell scripts, vi editing commands; comprehensive revision and exam preparation.           | CO5           | Revision + question-bank practice             | Sessional Test – as per HSBTE; final assignment checking |

### 5. Continuous Assessment Plan – Theory

| Activity            | Planned Timing        | Coverage                               | Purpose               |
|---------------------|-----------------------|----------------------------------------|-----------------------|
| Assignment I        | 1st week of August    | OS basics/process concepts             | Formative learning    |
| 1st Sessional Test  | As per HSBTE          | As per HSBTE                           | Internal assessment   |
| Quiz/Class Test I   | 2nd week of September | Units I–II                             | Formative assessment  |
| Assignment II       | 1st week of September | Scheduling/deadlocks                   | Problem solving       |
| 2nd Sessional Test  | As per HSBTE          | As per HSBTE                           | Internal assessment   |
| Quiz/Class Test II  | 2nd week of October   | Units III–IV                           | Formative assessment  |
| Assignment III      | 1st week of October   | Memory/file management                 | Concept consolidation |
| 3rd Sessional Test  | As per HSBTE          | As per HSBTE                           | Internal assessment   |
| Quiz/Class Test III | 2nd week of November  | Unit V + revision                      | Formative assessment  |
| Remedial Classes    | After each sessional  | Weak areas identified from performance | Improvement           |