**Session 2025-2026**

| **Vision:** Dream of where you want. | **Mission:** Means to achieve Vision |
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**Program Educational Objectives of the program (PEO):** (broad statements that describe the professional and career accomplishments)

| PEO1 | **Preparation** | **P: Preparation** | **Pep-CL abbreviation**  **pronounce as Pep-si-lL easy to recall** |
| --- | --- | --- | --- |
| PEO2 | **Core Competence** | **E: Environment (Learning Environment)** |
| PEO3 | **Breadth** | **P: Professionalism** |
| PEO4 | **Professionalism** | **C: Core Competence** |
| PEO5 | **Learning Environment** | **L: Breadth (Learning in diverse areas)** |

**Program Outcomes (PO):** (statements that describe what a student should be able to do and know by the end of a program)

**Keywords of POs:**

Engineering knowledge, Problem analysis, Design/development of solutions, Conduct Investigations of Complex Problems, Engineering Tool Usage, The Engineer and The World, Ethics, Individual and Collaborative Team work, Communication, Project Management and Finance, Life-Long Learning

**PSO Keywords:** Cutting edge technologies, Research

“I am an engineer, and I know how to apply engineering knowledge to investigate, analyse and design solutions to complex problems using tools for entire world following all ethics in a collaborative way with proper management skills throughout my life.” *to contribute to the development of cutting-edge technologies and Research*.

**Integrity:** I will adhere to the Laboratory Code of Conduct and ethics in its entirety.

**Name and Signature of Student and Date**

(Signature and Date in Handwritten)

| **Session** | **2025-26 (ODD)** | | **Course Name** | **HPC Lab** | |
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| **Semester** | **7** | | **Course Code** | **22ADS706** | |
| **Roll No** |  | | **Name of Student** |  | |
|  |  | |  |  |  |
| Practical Number | | **Practical 1** | | | |
| Course Outcome | | Upon successful completion of the course the students will be able to   1. To familiarize students with basic Linux commands and file systems. 2. To understand the structure and purpose of a High-Performance Computing (HPC) environment. 3. To learn how to access and use a remote HPC cluster using SSH. | | | |
| Aim | | **Introduction to Linux Operating System and HPC Environment** | | | |
| Problem Definition | | To understand and practice the fundamentals of the Linux operating system and the High-Performance Computing environment by learning basic Linux commands, remote access techniques (SSH), module handling, and job submission using a scheduler in an HPC cluster. | | | |
| Theory | | Linux is an open-source, Unix-like operating system that provides stability, flexibility, and security, making it widely used in servers, scientific research, and High Performance Computing (HPC) environments. HPC refers to the use of parallel and distributed computing to solve large-scale and complex problems at much higher speeds than typical computers. An HPC system is usually organized as a cluster consisting of a head node (for login and job submission), compute nodes (for executing tasks), and a job scheduler (such as SLURM or PBS) that manages resources. Users interact with HPC systems using Linux commands, SSH, modules, and job scripts. | | | |
| Procedure and Execution : | | Commands:  ls   List files and directories  cd   Change directory  pwd   Print working directory  mkdir   Create a new directory  rm   Remove files  cp   Copy files  mv   Move or rename files  chmod   Change file permissions  top   Display running processes  ps   View current processes  man   Manual for commands  srun   Run interactive HPC job  sbatch   Submit batch HPC job  squeue   View job queue | | | |
| Code: | | | |
| Output:  Screenshot from 2025-08-26 11-37-23.png  Screenshot from 2025-08-26 11-37-11.png | | | |
| Output Analysis : | | The job runs on an allocated compute node in the HPC cluster and prints the hostname, confirming successful execution. SLURM schedules the job according to resource requests and time limits specified in the batch script. | | | |
| Link of student Github profile where lab assignment has been uploaded | |  | | | |
| Conclusion | | This practical provided an introduction to Linux commands, HPC environment basics, and job scheduling using SLURM. Understanding HPC system components and parallel computing fundamentals is essential for efficient usage of supercomputers. Practicing job submission and monitoring prepares students for complex HPC workflows in scientific and engineering computations. | | | |
| Plag Report (Similarity index < 12%) | |  | | | |
| Date | |  | | | |