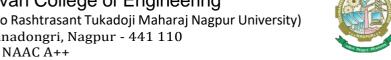Nagar Yuwak Shikshan Sanstha's
Yeshwantrao Chavan College of Engineering
(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)
Hingna Road, Wanadongri, Nagpur - 441 110
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Department of Computer Technology

Vision of the Department

To be a well-known centre for pursuing computer education through innovative pedagogy, value-based education and industry collaboration.

Mission of the Department

To establish learning ambience for ushering in computer engineering professionals in core and multidisciplinary area by developing Problem-solving skills through emerging technologies.

Session 2025-2026

Vision: To harness the power of artificial intelligence and data science to solve real-world problems and enhance human potential.	**Mission:** To acquire skills through coursework, projects, and internships, while actively engaging in research and collaboration with peers to innovate and apply AI solutions.

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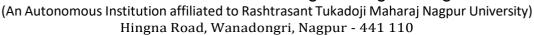
Integrity: I will adhere to the Laboratory Code of Conduct and ethics in its entirety.

Prerana Bijekar   28 August 2025
Name and Signature of Student and Date
(Signature and Date in Handwritten)

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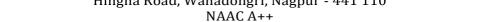| Session	2025-26 (ODD)	Course Name	HPC Lab
Semester	7	Course Code	22ADS706
Roll No	11	Name of Student	Prerana Bijekar

Practical Number	1
Course Outcome	**CO1:** Understand and Apply Parallel Programming Concepts **CO2:** Analyze and Improve Program Performance. **CO3:** Demonstrate Practical Skills in HPC Tools and Environments.
Aim	Introduction to Linux and HPC Environment
Theory (100 words)	1. Linux Basics: • Open-source, UNIX-based operating system. • Multi-user, multi-tasking with strong security. • Organized file system (/ root). • Mostly used via command line. • Package managers: apt, yum, etc. 2. HPC Environment: • High-Performance Computing = solving large problems using clusters/supercomputers. • Cluster has head node (job submission), compute nodes (processing), storage nodes (data). • Uses parallel computing (MPI, OpenMP). • Job schedulers (SLURM, PBS) manage resources. • Shared file systems (NFS, Lustre). • Widely used in science, AI, weather, bioinformatics. • Almost all HPC systems run on Linux.

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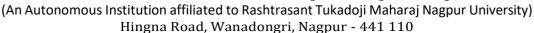
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Procedure and Execution (100 Words)	Algorithm: 1. Linux Commands: • ls: to see saved files • pwd: present directory • mkdir: create new directory • cd: change directory • touch filename.extension: creating new file • mkdir foldername: creating new directory • vi filename.extension: open file in editor • rm filename.extension: delete file • rmdir foldername: delete directory 2. HPC Commands: • top: shows running files • esc+exit: exits from top • q: return to write commands • lscpu: CPU details
	Code: • Creating directory: mkdir HPC • Creating files: touch file1.txt • Copying content of one file to another: cp file1.txt file2.txt • Listing directories: ls • Deleting file: rm first.sh

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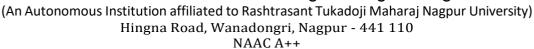
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Output:

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Output Analysis	The Linux and HPC environment together provide a stable, secure, and scalable platform for running computationally intensive tasks. Linux ensures efficient system management, while HPC clusters enable parallel execution and resource sharing, leading to faster problem-solving in research and industry.
Github Link	https://github.com/Prerana-Bijekar/HPC
Conclusion	Linux serves as the backbone of HPC environments due to its flexibility, reliability, and open-source nature. Combined with powerful cluster architectures, it enables efficient handling of large-scale computations, making it essential for modern scientific research and advanced data-driven applications.
Plag Report (Similarity index < 12%)	
Date	28 August 2025