Nagar Yuwak Shikshan Sanstha's





(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Hingna Road, Wanadongri, Nagpur - 441 110







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 Problemsolving skills through emerging technologies.

Session 2025-2026

Vision: To harness the power of artificial	Mission: To acquire skills through
intelligence and data science to solve real-world	coursework, projects, and internships, while
problems and enhance human potential.	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
PEO2	Core Competence	E: Environment	pronounce as Pep-si-lL
		(Learning Environment)	easy to recall
PEO3	Breadth	P: Professionalism	
PEO4	Professionalism	C: Core Competence	
PEO5	Learning	L: Breadth (Learning in	
	Environment	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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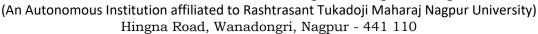
Session	2025-26 (ODD)	Course Name	HPC Lab
Semester	7	Course Code	22ADS706
Roll No	11	Name of Student	Prerana Bijekar

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)	 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. 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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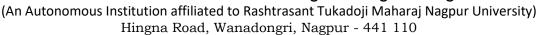
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Procedure and	Algorithm:
Execution	1. Linux Commands:
(100 Words)	• ls: to see saved files
	pwd: present directory
	mkdir: create new directory
	cd: change directory
	 touch filename.extension: creating new file
	mkdir foldername: creating new directory
	 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: Is
	 Deleting file: rm first.sh

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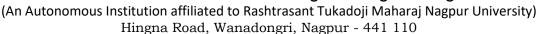
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Output Analysis	The Linux and HPC environment together provide a stable, secure, and scalable platform for running computationally intensive tasks. Linux ensures efficient system management, while HPC clusters enable parallel execution and resource sharing, leading to faster problemsolving in research and industry.	
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.	
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