राष्ट्रीय प्रौद्योगिकी संस्थान पटना / NATIONAL INSTITUE OF TECHNOLOGY PATNA
संगणक विज्ञान एंव अभियांत्रिकी विभाग / DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
अशोक राजपथ, पटना-८००००५, बिहार / ASHOK RAJPATH, PATNA-800005, BIHAR
Phone No.: 0612-2372715, 2370419, 2370843, 2371929 Ext- 200, 202 Fax-0612-2670631 Website: www.nitp.ac.in

No:- **Date:**

CSXX1924 ***Distributed and Parallel Computing*** **L-T-P-Cr: 3-0-0-3**

Pre-requisites: Computer Programming, OOPS, Database Management Systems, Computer Networks

Objectives:

- Learn architecture, algorithms and computational models used in Distributed, Cloud and parallel systems.
- Understanding of various trade-offs involved in system design and performance analysis
- Understand various libraries for Distributed, Parallel and cloud computing platforms using various case studies.

Course Outcomes:

At the end of the course, a student should have:

Sl. No.	Outcome	Program Outcome
1.	Learn architecture, algorithms and computational models used in Distributed, Cloud and parallel systems.	PO1, PO2, PO12
2.	Understanding of various trade-offs involved in system design and performance analysis.	PO3, PO4, PO12
3.	Understand various libraries for Distributed, Parallel and cloud computing platforms using various case studies.	PO5, PO3, PO12

Unit 1: Overview of C, UNIX and UNIX system calls. **2 Lectures**

Unit 2: Introduction: Definition of a distributed system, goals, hardware concepts, software concepts, the client-server model. **6 Lectures**

Unit 3: Communication: Layered Protocols, Remote Procedure Call, Remote Object Invocation, Message-Oriented and Stream-Oriented Communication. **6 Lectures**

Unit 4: Processes: Threads, Servers, Code Migration and Software Agents. **4 Lectures**

Unit 5: Naming: Naming Entities, Locating Mobile Entities, Removing Unreferenced Entities. **4 Lectures**

Unit 6: Synchronization: Clock Synchronization, Logical Clocks and Election Algorithms. **6 Lectures**

Unit 7: Parallel Computing: Parallel Computer memory architectures, Programming Models, Shared memory model, Flynn's Programming model, Pipeline computations. Automatic vs Manual Parallelization, Data dependencies, Load balancing. **8 Lectures**

Unit 8: Cloud Computing: Cloud Computing Models, Web Application Framework, Cloud Web Services, Service Oriented Architectures towards Cloud Computing. **6 Lectures**

Text Books:

1. Distributed Systems: Principles and Paradigms, Andrew Tanenbaum and Maarten van Steen, Prentice Hall.
2. Distributed Systems: Concepts and Design, George Coulouris, Jean Dollimore, and Tim Kindberg