

Course Objective:

The objective is to gain knowledge in issues for constructing the distributed systems, examine how the message oriented communication can be done in a Distributed system to achieve the synchronous and asynchronous communication, implement the suitable clock Synchronization algorithms to manage the resources in a distributed operating system environment, compare the client and data centric consistency models to improve performance and scalability in terms of memory, and analyze issues dealing with recovery failure and able to implement Distributed file system in Network file system.

Module – I

Need for Parallel Computers, Models of Computation, Analyzing Parallel Algorithms, Expressing Parallel Algorithms, Matrix Vector Multiplication, Matrix Matrix Multiplication, Database Query Processing, 15 Puzzle Problem, Parallel Discrete Event Simulation, Image Dithering, Dense LU Factorization.

Module – II

Hyper Quick Sort, Merge Sort, Bitonic Merge Sort, Odd Even Transposition, Enumeration Sort, Sorting on the CRCW Model, CREW Model and EREW Model, MPI and PVM.

Module – III

Introduction to Distributed Systems, Routing Algorithms, Destination-Based Routing, The All-Pairs Shortest-Path Problem, The Netchange Algorithm, Routing with Compact Routing Tables, Hierarchical Routing.

Module – IV

Fault Tolerance in Distributed Systems, Fault Tolerance in Asynchronous and Synchronous Systems, Failure Detection, Stabilization.

Course Outcome:

CO1: Gain knowledge in issues for constructing the distributed systems

CO2: Examine how the message oriented communication can be done in a Distributed system to achieve the synchronous and asynchronous communication

CO3: Implement the suitable clock Synchronization algorithms to manage the resources in a distributed operating system environment.

CO4: Compare the client and data centric consistency models to improve performance and scalability in terms of memory.

CO5: Analyze issues dealing with recovery failure and able to implement Distributed file system in Network file system

Text Books

1. G. Tel, Introduction to Distributed Algorithms, 2nd Edition, Cambridge University Press, 2000.
2. Ananth Grama, Anshul Gupta, George Karypis, Vipin Kumar, Introduction to Parallel Computing, Second Edition, Addison Wesley, 2003.

Reference Books:

1. F. T. Leighton, Introduction to Parallel Algorithms and Architectures: Arrays, Trees, Hypercubes, M K Publishers, San Mateo California, 1992.
2. B. Wilkinson, M. Allen, Parallel Programming Techniques and Applications using Networked Workstations and Parallel Computers, Prentice Hall, 2005.
3. Michael J. Quinn, Parallel Computer Theory and Practice, McGraw Hill, Second Edition, 1994.
4. S. G. Akl, The Design and Analysis of Parallel Algorithms, PHI, 1989.