PARALLEL & DISTRIBUTED SYSTEM

Paper Code	**CEN-606**
Course Credits	**4**
Lectures / week	**3**
Tutorial / week	**1**
Course Description	**UNIT – I**

Basic Concepts: Introduction to parallel processing, parallel processing terminology, decomposition, complexity, throughout, speedup, measures, data dependence, resource dependence, Bernstein's conditions levels of parallelism in programs. Program flow-control flow, data flow, Distributed systems – Introduction, advantages, and tightly-coupled loosely-coupled systems. Hardware and software requirements, design issues.

UNIT- II

Parallel Processing – Structure & Organization: Taxonomy of parallel processes: granularity, basic architectures, multiprocessors, vector processors, pipeline:-both linear as well as non liner pipeline ,optimal design, Arithmetic pipeline, Instruction pipeline, Pipeline hazards and their solution ,reservation table, scheduling;,

UNIT- III

Distributed Computing-introduction, definition , its history; Distributed Computing system definition and its evolution, reasons for its popularity, Strength and weaknesses of distributed computing, Different forms of Computing: Minicomputer model, workstation model, workstation server model, Processor pool Model; Cluster:- definitions, reasons for its popularity cluster computer system architecture, Windows cluster, Solaris cluster, Linux cluster; Using cluster, distributed Computing System models: Distributed operating system, Introduction to DCE, architecture of Distributed Applications

UNIT- IV

Clock: Types of Clock, Synchronization of clocks, types of Clock synchronization algorithms, lamport time stamps, Message passing:-

introduction, desirable features of a good message passing system, Issues in IPC by Message passing, synchronization, Buffering, Multi-datagram messages, Encoding and decoding of message data, Process addressing, Failure handling, IPC, Distributed Election, types of election algorithms.

UNIT – V

References / Text Books:

Parallel & Distributed Programming: Parallel Programming environments, models, synchronous asynchronous programming, modulla-2, occamm, FORTRAN, DAP FORTRAN, C-linda, Actus, data flow programming, VAL etc,. MPI, Open MP

- Michael J. Quinn, "Parallel Computing – Theory and Practice, 2nd Edition, McGraw Hill, 1994
- Kai Hwang, "Advanced Computer Architecture – Parallelism, Scalability, Programmability", McGraw Hill Inc, 1993.
- Wilkinson, "Parallel Programming using networked computer" , Pearson Education India, 20006
- S. G. Akl, "The Design and Analysis of parallel algorithms", Englewood Cliffs, NJ, 1989
- S. Tanenbaum, "Modern Operating System", PHI, 1996.
- R. H. Perrott, "Parallel Programming", Addison Wesley, 1987.
- T. G. Lewie and H. Ele-Revini, "Introduction to Parallel computing", PHI, NJ, 1992.
- S. Lakshmivardhan and S.K. Dhall, "Analysis and design of parallel algorithm – arithmetic and matrix problems", McGraw Hill, 1990
- J. M. Crichlow, "An introduction to distributed and parallel computing", PHI, 1988
- Pradeep K. Sinha," Distributed Systems"

Computer Usage / Software Requires: