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| IV YEAR SEM-II B.Tech CSE | ELECTIVE | L | T | P | C |
| Code: CS4602 | Parallel Algorithms | 2 | 2 | 0 | 4 |

UNIT I

Parallel Models: SIMD, MIMD, PRAMs, Interconnection Networks. Performance Measures (Time, Processors, Space, Work).

UNIT II

Interconnection Architectures (Linear Array, Meshes, Trees, Mesh of Trees, Hyper cubes, Butterfly Networks, Cube Connected Cycles, Benes Networks).

UNIT III

Balanced Trees, Pointer Jumping, Divide and Conquer, Partitioning, Pipelining, Systolic Computation.

UNIT IV

Accelerated Cascading, Prefix Computation, List Ranking, Euler Tour, Tree Contraction.

UNIT V

Sorting, Searching, Merging; Matrix Operations

UNIT VI

Graph Algorithms (Connected Components, Spanning Trees, Shortest Paths), Complexity (Lower bounds, NC Class and PCompleteness).

Text Books:

- 1) Joseph Jaja, "An Introduction to Parallel Algorithms", Addison Wesley, 1992.
- 2) S. Akl, "Design and Analysis of Parallel Algorithms", Prentice Hall Inc, 1992.

Reference books:

- 1) H. Sparkias and A. Gibbon. Lecture notes on "Parallel Computation", Cambridge University Press, 1993.
- 2) K. Hwang and F. A. Briggs. "Computer Architecture and Parallel Processing", McGraw Hill Inc., 1985.
- 3) Web course by IIT Madras. <http://nptel.ac.in/courses/106106112/>

Video Reference:

| Title | Expert Name | Affiliation | Weblink |
|---------------------|----------------------|--------------------|---|
| Parallel Algorithms | Prof. Phalguni Gupta | IIT Kanpur | http://nptel.ac.in/courses/106104120/ |