JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

IV Year B.Tech. IT. I-Sem.

PARALLEL COMPUTING

UNIT I:

Introduction: Computational demand in various application areas, advent of parallel processing, terminology-pipelining, Data parallelism and control parallelism-Amdahl's law. Basic parallel random access Machine Algorithms-definitions of P, NP and NP-Hard, NP-complete classes of sequential algorithms; NC–class for parallel algorithms.

UNIT II:

Scheduling: Organizational features of Processor Arrays, Multi processors and multi-computers. Mapping and scheduling aspects of algorithms. Coffman-graham scheduling algorithm for parallel processors.

UNIT III:

Algorithms-1: Elementary Parallel algorithms on SIMD and MIMD machines, Analysis of these algorithms. Matrix Multiplication algorithms on SIMD and MIMD models.

UNIT IV:

Algorithms-2: Fast Fourier Transform algorithms. Implementation on Hyper cube architectures. Solving linear file -system of equations, parallelizing aspects of sequential methods back substitution and Tri diagonal.

UNIT V: Array processors: Array processors, 2D-Mesh processor and Hypercube Processor Array.

UNIT VI:

Sorting: Parallel sorting methods, Odd-even transposition Sorting on processor arrays, Parallel Quick-sort on Multi processors. Hyper Quick sort on hypercube multi computers, merge sort on shuffle-exchange ID.

UNIT VII:

Searching-1: Parallel search operations. Ellis algorithm and Manber and ladner's Algorithms for dictionary operations.

UNIT VIII:

Searching-2: Parallel algorithms for Graph searching, All Pairs shortest paths and minimum cost spanning tree.

TEXT BOOKS:

1. Parallel Computing Theory and Practice, Michel J.Quinn
2. Programming Parallel Algorithms, Guy E. Blelloch, Communications of the ACM