Parallel Computing
CS801B
Contracts: 3L
Credits- 3

Module I
Introduction.-Parallel Processing Environment- Pipelining and Data Parallelism, Scalability, Flynn's Taxonomy,. (3L)
Parallel Processing organization- Mesh, Hyper-tree, Pyramid, Butterfly, Hypercube network (4L)

Module II
Parallel Algorithms -Structure, cost, Analysis ;Elementary Algorithms: Broadcast, Prefix sums, All sums (4L)
Algorithms on Selection problem, Merging-Odd-even merging network, CREW Merging, N-ary searching (6L)
Matrix Transposition ,Matrix Multiplications- 2D Mesh SIMD ,Hypercube SIMD, Shuffle-Exchange SIMD models. Discrete Fourier Transform, Fast Fourier Transform (6L)

Module III
Linear system of equations- Gaussian Elimination, Gauss-Seidel algorithm, Jacobi algorithm (3L)
Sorting - Enumeration sort, Odd-even transposition sort, Bitonic merge
Ellis's Algorithm (3L)

Module IV
Graph Algorithms, Spanning Tree Algorithms, (4L)
Parallel Programming Languages -FORTRAN 90, OCCAM(4L)

Books for reference:
1. Parallel Computing -Theory and Practice -Michael J. Quinn (McGraw Hill Inc.)
2. Design and Analysis of Parallel Algorithms- S.G. Akl (PH)