

OUTCOMES:**Upon completion of the course, the student will be able to**

- Design algorithms by employing Map Reduce technique for solving Big Data problems.
- Identify similarities using appropriate measures.
- Point out problems associated with streaming data and handle them.
- Discuss algorithms for link analysis and frequent itemset mining.
- Design solutions for problems in Big Data by suggesting appropriate clustering techniques.

REFERENCES:

1. Jure Leskovec, AnandRajaraman, Jeffrey David Ullman, "Mining of Massive Datasets", Cambridge University Press, Second Edition, 2014.
2. Jiawei Han, MichelineKamber, Jian Pei, "Data Mining Concepts and Techniques", Morgan Kaufman Publications, Third Edition, 2011.
3. Ian H.Witten, Eibe Frank "Data Mining – Practical Machine Learning Tools and Techniques", Morgan Kaufman Publications, Third Edition, 2011.
4. David Hand, HeikkiMannila and Padhraic Smyth, "Principles of Data Mining", MIT Press, 2001.

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CP5084**PARALLEL ALGORITHMS****L T P C
3 0 0 3****OBJECTIVES:**

- To learn parallel algorithms development techniques for shared memory and DCM models.
- To study the main classes of fundamental parallel algorithms.
- Learn to design efficient parallel algorithms.
- To study the complexity and correctness models for parallel algorithms.
- To understand parallel solutions for bitwise computation.

UNIT I INTRODUCTION**9**

Introduction to Parallel Algorithms – Models of computation – Selection – Merging on EREW and CREW – Median of two sorted sequence – Fast Merging on EREW – Analyzing Parallel Algorithms

UNIT II SORTING & SEARCHING**9**

Sorting Networks – Sorting on a Linear Array – Sorting on CRCW, CREW, EREW – Searching a sorted sequence – Searching a random sequence – Bitonic Sort

UNIT III ALGEBRAIC PROBLEMS**9**

Permutations and Combinations – Matrix Transpositions – Matrix by Matrix Multiplications – Matrix by Vector Multiplication.

UNIT IV GRAPH & GEOMETRY**9**

Connectivity Matrix – Connected Components – All Pair Shortest Paths – Minimum Spanning Trees – Point Inclusion – Intersection, Proximity and Construction Problems

UNIT V OPTIMIZATION & BIT COMPUTATIONS**9**

Prefix Sums – Job Sequencing – Knapsack – Adding Two Integers – Adding n Integers – Multiplying Two Integers – Selection

TOTAL : 45 PERIODS**OUTCOMES:**

Upon completion of the course, the student will be able to

- Understand the difference between sequential and parallel algorithms.
- Design parallel algorithms in various models of parallel computation.
- Apply a suitable model for developing a parallel algorithm.
- Know the basic issues associated with implementing parallel algorithms.
- Understand the differences among several algorithms used for solving the same problem and recognize which one is better under different conditions.

REFERENCES:

1. Selim G. Akl, "The Design and Analysis of Parallel Algorithms", Prentice Hall, New Jersey, 1989.
2. Michael J. Quinn, "Parallel Computing: Theory & Practice", Tata McGraw Hill Edition, 2003.
3. Joseph JaJa, "Introduction to Parallel Algorithms", Addison-Wesley, 1992.

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