CS316: Parallel Algorithms	L	T	P	Data Structures, Algorithms
	3	1	0	

Course Objective: To introduce parallel algorithms and compare it with its sequential equivalent.

S. No.	Course Outcomes (CO)
CO1	Understand parallel computing models and analyze parallel algorithms.
CO2	Implement dense matrix multiplication algorithms.
CO3	Apply decomposition and mapping techniques to various problems.
CO4	Use parallel sorting algorithms like Hyper Quick Sort and Merge Sort.
CO5	Implement parallel searching and selection algorithms.
CO6	Apply parallel algorithms to graph problems such as coloring and shortest paths.

S. No	Contents	Contact Hours

UNIT 1	Introduction: Need for parallel computers ,Models of computation,Analyzing parallel algorithms, Expressing parallel algorithms	**4**
UNIT 2	Dense matrix multiplication algorithms: Matrix vector Multiplication, Matrix multiplication.	**6**
UNIT 3	Decomposition & Mapping techniques: Database query processing, 15 puzzle problem, Parallel discrete event simulation, Image dithering, Dense LU factorization	**8**
UNIT 4	Sorting : Hyper quick sort, Merge sort, Bitonic merge sort, odd even transposition, Enumeration sort (sorting on the CRCW model, CREW model and EREW model)	**10**
UNIT 5	Searching and selection: Searching on a sorted sequence (EREW,CREW,CRCW), Searching on a random sequence (EREW, CREW, CRCW, Tree and Mesh), Sequential selection algorithm, Parallel selection algorithm(EREW parallel solution)	**10**
UNIT 6	Graph Algorithm: Graph coloring ,Minimal spanning tree , Shortest path algorithm	**10**
	Total	**48**