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Subject: DSA syllabus

Course Title: DATA STRUCTURE& ALGORITHM	Course Code	:CP201
Semester : III	Core / Elective	: PC
Teaching Scheme in Hrs (L:T:P) : 3:0:0	Credit	: 3 Credit
Type of course : Lecture + Assignments	Total Contact Hours	: 36
Continuous Internal Evaluation : 40 Marks	ESE	: 60 Marks
Programmes : B.TECH. CSE		

DETAILED SYLLABUS

Topic and Contents	Hours	Marks
UNIT-1: Introduction to Data Structure & Arrays	7	20
Data Structure: Definition, Implementation, Operation, Application, Algorithm writing and convention. Analysis of algorithm, Complexity Measures and Notations Arrays: Representation of arrays (multidimensional), Address calculation using column and row major ordering, Sparse matrix.		
UNIT-2: Linked Lists	7	20
Linked Lists: Implementation, Doubly linked list, Circular linked list, unrolled linked list, skip-lists, Splices, Sentinel nodes, Application (Sparse Matrix, Associative Array, Functional Programming)		
UNIT-3 Stack & Queue	7	20
Stack: Definition, Implementation, Application (Tower of Hanoi, Function Call and return, Parentheses Matching, Back-tracking, Expression Evaluation) Queue: Definition, de-queue, en-queue, priority queue, bounded queue, Implementation, Application		
UNIT-4: Trees	7	20
Tree: Definition of elements, Binary trees: Types (Full, Complete, Almost complete), Binary Search Tree, Traversal (Pre, In, Post & Level order) Pruning, Grafting. Application: Arithmetic Expressions Evaluation Variations: Indexed Binary Tree, Threaded Binary Tree, AVL tree, Multi-way trees, B tree, B+ tree, Forest, Trie and Dictionary		
UNIT-5: Graphs & Sorting	8	20
Graphs: Elementary definition, Representation (Adjacency Matrix, Adjacency Lists) Traversal (BFS, DFS) Application: Spanning Tree (Prim and Kruskal Algorithm) Dijkstra's algorithm, shortest path algorithms. Sorting: Bubble, Selection, Insertion, Quick, Radix Merge, Bucket, Heap, Searching: Hashing, Symbol Table, Binary Search, Simple String Searching		
TOTAL	36	100

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