Haryana Engineering College, Jagadhri

Lesson Plan of M. Tech. Computer Science Engineering Deptt.

2nd Semester

Subject : Advance Algorithms (MT-CSE-18-21)

Day	Topic / Chapter Covered	Academic Activity	Test/Assignment
Day 1	Sorting	Lecture	
Day 2	Review of various sorting algorithms	Lecture	
Day 3	Topological sorting	Lecture	
Day 4	Graph	Lecture	
Day 5	Definitions and Elementary Algorithms	Lecture	
Day 6	Shortest path by BFS	Lecture	
Day 7	Shortest path in edge-weighted case (Dijkasra's)	Lecture	
Day 8	Depth-first search and computation of strongly connected components	Lecture	Assignment 1
Day 9	Emphasis on correctness proof of the algorithm and time/space analysis	Lecture	
Day10	Example of amortized analysis.	Lecture	
Day11	Flow-Networks	Lecture	
Day12	Maxflow-mincut theorem	Lecture	
Day13	Ford-Fulkerson Method to compute maximum flow	Lecture	
Day14	Edmond-Karp maximum-flow algorithm	Lecture	
Day15	Graph Matching	Lecture	
Day16	Algorithm to compute maximum matching	Lecture	
Day17	Characterization of maximum matching by augmenting paths	Lecture	
Day18	Edmond's Blossom algorithm to compute augmenting path.	Lecture	Assignment 2
Day19	Shortest Path in Graphs	Lecture	
Day20	Floyd-Warshall algorithm	Lecture	
Day21	Introduction to dynamic programming paradigm	Lecture	
Day22	More examples of dynamic programming	Lecture	
Day23	Matrix Computations	Lecture	
Day24	Strassen's algorithm	Lecture	
Day25	Introduction to divide and conquer paradigm	Lecture	
Day26	Inverse of a triangular matrix	Lecture	
Day27	Relation between the time complexities of basic matrix operations	Lecture	Assignment 3
Day28	UP-decomposition	Lecture	
Day29	Linear Programming	Lecture	

Day30	Geometry of the feasibility region	Lecture	
Day31	Simplex algorithm NP-completeness	Lecture	
Day32	Examples	Lecture	
Day33	Proof of NP-hardness and NP-completeness	Lecture	
Day34	Modulo Representation of integers/polynomials	Lecture	
Day35	Chinese Remainder Theorem	Lecture	Assignment 4
Day36	Conversion between base-representation	Lecture	
Day37	Modulo-representation	Lecture	
Day38	Extension to polynomials	Lecture	
Day39	Application: Interpolation problem	Lecture	

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Haryana Engineering College, Jagadhri
Lesson Plan of M. Tech. Computer Science Engineering Deptt.
2nd Semester

Subject : Soft Computing (MT-CSE-18-22)

Day	Topic / Chapter Covered	Academic Activity	Test/Assignment
Day 1	Introduction to Soft Computing	Lecture	
Day 2	Neural Networks	Lecture	
Day 3	Evolution of Computing	Lecture	
Day 4	Soft Computing Constituents	Lecture	
Day 5	From Conventional AI to Computational Intelligence	Lecture	
Day 6	From Conventional AI to Computational Intelligence	Lecture	
Day 7	Machine Learning Basics	Lecture	
Day 8	Fuzzy Logic	Lecture	Assignment 1
Day 9	Fuzzy Sets	Lecture	
Day10	Operations on Fuzzy Sets	Lecture	
Day11	Fuzzy Relations	Lecture	
Day12	Membership Functions	Lecture	
Day13	Fuzzy Rules	Lecture	
Day14	Fuzzy Reasoning	Lecture	
Day15	Fuzzy Inference Systems	Lecture	
Day16	Fuzzy Expert Systems	Lecture	
Day17	Fuzzy Decision Making	Lecture	
Day18	Implementation using Python/Matlab	Lecture	Assignment 2
Day19	Neural Networks	Lecture	
Day20	Machine Learning Using Neural Network	Lecture	
Day21	Machine Learning Using Neural Network	Lecture	
Day22	Adaptive Networks	Lecture	
Day23	Feed forward Networks	Lecture	
Day24	Supervised Learning Neural Networks	Lecture	
Day25	Radial Basis Function Networks	Lecture	
Day26	Reinforcement Learning	Lecture	
Day27	Unsupervised Learning Neural Networks	Lecture	Assignment 3
Day28	Unsupervised Learning Neural Networks	Lecture	
Day29	Adaptive Resonance architectures	Lecture	
Day30	Advances in Neural networks	Lecture	
Day31	Implementation using Python/Matlab	Lecture	
Day32	Genetic Algorithms	Lecture	
Day33	Introduction to Genetic Algorithms (GA)	Lecture	
Day34	Applications of GA in Machine Learning	Lecture	

Day35	Machine Learning Approach to Knowledge Acquisition	Lecture	Assignment 4
Day36	Implementation using Python/Matlab	Lecture	

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Haryana Engineering College, Jagadhri

Lesson Plan of M. Tech. Computer Science Engineering Deptt.

2nd Semester

Subject : Advanced Computer Architecture (MT-CSE-18-24(i))

Day	Topic / Chapter Covered	Academic Activity	Test/Assignment
Day 1	Instruction Level Parallelism (ILP): Concepts & Challenges	Lecture	
Day 2	Data Dependences and Hazards, Control Dependences	Lecture	
Day 3	Basic Compiler Techniques for Exposing ILP	Lecture	
Day 4	Basic Pipeline Scheduling and Loop Unrolling	Lecture	
Day 5	Reducing Branch Costs with Advanced Branch Prediction	Lecture	
Day 6	Overcoming Data Hazardous with Dynamic Scheduling	Lecture	
Day 7	Tomasulo's Approach, Hardware Based Speculation	Lecture	
Day 8	Exploiting ILP Using Multiple Issue and Static Scheduling	Lecture	Assignment 1
Day 9	VLIW & Superscalar Processors	Lecture	
Day10	Advanced Techniques For Instruction Delivery and Speculation.	Lecture	
Day11	Data Level Parallelism in Vector	Lecture	
Day12	SIMD & GPU Architectures: Vector Architecture	Lecture	
Day13	Working of Vector Processors, Vector Execution Time	Lecture	
Day14	Multiple Lanes, Vector Registers	Lecture	
Day15	Memory Banks, Stride	Lecture	
Day16	Gather Scatter	Lecture	
Day17	SIMD Instruction Set Extensions for Multimedia	Lecture	
Day18	Graphics Processing Units, Vector Architecture V/S GPUs	Lecture	Assignment 2
Day19	Multimedia SIMD V/S GPUs	Lecture	
Day20	Detecting and Enhancing Loop-Level Parallelism – Finding Dependences	Lecture	
Day21	Eliminating Dependent Computations.	Lecture	
Day22	Thread-Level Parallel Parallelism: Multiprocessor Architecture	Lecture	
Day23	Centralized Shared-Memory Architectures, Cache Coherence Problem	Lecture	
Day24	Schemes Enforcing Coherence, Snooping Coherence Protocol	Lecture	

Day25	Extensions to basic coherence protocol	Lecture	
Day26	Distributed Shared-Memory and Directory-Based Coherence	Lecture	
Day27	Warehouse-Scale Computers (WSC) to Exploit Request-Level and Data-Level Parallelism	Lecture	Assignment 3
Day28	WSC V/S Servers, Programming Models and Workloads for WSC	Lecture	
Day29	Architecture of Warehouse-Scale Computers	Lecture	
Day30	Physical Infrastructure and Costs of WSC	Lecture	
Day31	Memory Hierarchy: Basics of Memory Hierarchy	Lecture	
Day32	Optimization of Cache Performance, Memory Technology & Optimizations	Lecture	
Day33	Virtual Memory – Fast Address Translation	Lecture	
Day34	Selecting Page Size, Protection of Virtual Memory	Lecture	
Day35	MIMD Architectures: Architectural Concepts of Distributed	Lecture	Assignment 4
Day36	Shared Memory MIMD Architectures (UMA, NUMA, COMA, CC-NUMA)	Lecture	
Day37	Interconnection Networks	Lecture	
Day38	Direct Interconnection Networks (Linear Array, Ring, Star, 2D Mesh, Hyper Cubes)	Lecture	
Day39	Switching Techniques	Lecture	
Day40	Dynamic Interconnection Networks (Shared Bus, Crossbar, Multistage Networks)	Lecture	
Day41	Specifications of Top Three Super Computers of Top500 List	Lecture	

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Haryana Engineering College, Jagadhri

Lesson Plan of M. Tech. Computer Science Engineering Deptt.

2nd Semester

Subject : Data Preparation and Aanlysis (MT-CSE-18-23(i))

Day	Topic / Chapter Covered	Academic Activity	Test/Assignment
Day 1	Data Gathering and Preparation	Lecture	
Day 2	High Cardinality Variable in Descriptive Stats	Lecture	
Day 3	High Cardinality Variable in Predictive Modeling	Lecture	
Day 4	Outliers	Lecture	
Day 5	Type of outliers	Lecture	
Day 6	Treatment of outliers	Lecture	
Day 7	Data formats	Lecture	
Day 8	Parsing and transformation	Lecture	Assignment 1
Day 9	Scalability and real-time issues	Lecture	
Day10	Data Cleaning: Consistency checking	Lecture	
Day11	Heterogeneous and missing data	Lecture	
Day12	Noisy Data	Lecture	
Day13	Data Cleaning as Process	Lecture	
Day14	Data Integration	Lecture	
Day15	Data Transformation and segmentation	Lecture	
Day16	Data Reduction	Lecture	
Day17	Data Cube Aggregation	Lecture	
Day18	Attribute Subset Selection	Lecture	Assignment 2
Day19	Concept hierarchy Generation	Lecture	
Day20	Exploratory Analysis	Lecture	
Day21	Descriptive and comparative statistics	Lecture	
Day22	Clustering	Lecture	
Day23	Clustering Hierarchical	Lecture	
Day24	Partitioning methods	Lecture	
Day25	Constraint-Based Cluster Analysis	Lecture	
Day26	Association Mining	Lecture	
Day27	Apriori Algorithm	Lecture	Assignment 3
Day28	Association to Correlations	Lecture	
Day29	Hypothesis Generation	Lecture	
Day30	Visualization	Lecture	
Day31	Data Visualization techniques (for measurement and categorical data)	Lecture	
Day32	Interactive visualization techniques	Lecture	
Day33	Common misuses of data visualization	Lecture	
Day34	Techniques for Statistical Inference Time series	Lecture	
Day35	Geolocated data	Lecture	Assignment 4
Day36	Correlations and connections	Lecture	
Day37	Hierarchies and networks	Lecture	

Day38	Interactivity	Lecture	

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