**Post Graduate Govt. College for Girls, Sector-42, Chandigarh**

**Teaching Plan for Post Graduate (First Semester)**

**Session (2020-2021)**

**Class: M.Sc. (IT) – I (1st sem) Name of the Teacher: Nidhi Goyal**

**Subject: Computer Algorithm Paper: MS - 62**

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| **S. No** | **Dates** | **Topics to be Covered** |
| Week 1 | 03/11/2020 – 07/11/2020 | Introduction to Data Structures: Definition, Types of Data Structures, Stacks and its operations(Push, Pop), |
| Week 2 | 09/11/2020 – 12/11/2020 | Queue and its operations (Insert, Delete), Tree (Binary Tree, General Tree and its Traversal), Graph(Types and its Traversal). |
| Week 3 | 16/11/2020 – 21/11/2020 | Algorithms and Analysis: Definition; Analysing algorithms; space and time complexity, Asymptotic Notation (O, Ω, θ) ), |
| Week 4 | 23/11/2020 – 28/11/2020 | Practical complexities, Best, average and worst case performance of algorithms, examples, Recursive algorithms, Introduction to recurrence relations. |
| Week 5 | 01/12/2020 – 05/12/2020 | Divide and Conquer: General method, Binary search, Merge sort, Quick sort. |
| Week 6 | 07/12/2020 – 12/12/2020 | Divide and Conquer: Selection problem, Strassen's matrix multiplication and analysis of these problems. |
| Week 7 | 14/12/2020 – 18/12/2020 | Greedy Method: General Method, Knapsack problem, Job sequencing with deadlines |
| Week 8 | 21/12/2020 – 26/12/2020 | Greedy Method: Minimum spanning Trees (Prim's Algorithm, Kruskal's Algorithm), Single source shortest paths and analysis of these problems. |
| Week 9 | 28/12/2020 – 02/01/2021 | Dynamic Programming: General method, Optimal binary search trees, 0/1 Knapsack |
| Week 10 | 04/01/2021 – 09/01/2021 | Dynamic Programming: the traveling salesperson problem, Single Source Shortest Path Problem (Bellman Ford Algorithm) |
| Week 11 | 11/01/2021 – 16/01/2021 | Dynamic Programming: All pair shortest path problem (Floyd's Algorithm). |
| Week 12 | 18/01/2021 – 23/01/2021 | Back Tracking: General method, N queen's problem, Graph coloring. |
| Week 13 | 25/01/2021 – 30/01/2021 | Back Tracking: Hamiltonian cycles, Analysis of these problems. |
| Week 14 | 01/02/2021 – 06/02/2021 | Branch-And-Bound: General Method, 0/1 Knapsack |
| Week 15 | 08/02/2021 – 13/02/2021 | Branch-And-Bound: Traveling Salesperson problems. |
| Week 16 | 15/02/2021 – 20/02/2021 | NP-hard and NP-complete problems: Basic concepts, Statement of Cook's Theorem, Satisfiability SAT, Examples of NP-hard graph [Clique Decision Problem, Chromatic Number 8 Decision Problem] |
| Week 17 | 22/02/2021 – 27/02/2021 | NP-scheduling problems [Scheduling Identical Processors, Job Shop Scheduling]. |