**Curriculum plan (Even Semester 2020-21)**

**Teacher Name: Neha Singh**

**Paper name: Design and Analysis of Algorithms**

**Class type: BSc. (h) Computer Science IV semester**

**Paper shared with: NIL**

|  |  |  |
| --- | --- | --- |
| **Unit to be taken** | **Month wise schedule to be followed** | **Tests/Assignments/ Revision/Presentations etc** |
| **Unit- 1**  **Algorithm Design Techniques**:  Iterative technique: Applications to Sorting and Searching (review), their correctness and analysis.  Divide and Conquer: Application to Sorting and Searching (review of binary search), merge sort, quick sort, their correctness and analysis. | Jan (Week II, III)  Jan (Week IV) | Test Ch 2 |
| **Unit 2**  More on Sorting and Searching: Heapsort  Lower Bounds using decision trees, sorting in Linear Time - Bucket Sort, Radix Sort and Count Sort  Medians & Order Statistics, complexity analysis and their correctness. | Jan (Week V)  Feb (Week I, II)  Feb (Week III, IV) | Assignment 1  Test Ch7  Test Ch 6 |
| **Unit 3**  **Advanced Analysis Technique:** Amortized analysis | March (Week I) | Assignment 2 |
| **Unit 4**  **Graphs**: Graph Algorithms - Breadth First Search, Depth First Search and itsApplications. | March (Week II,III) | Test Ch 8,9 |
| **Unit 1**  **Dynamic Programming**:  Application to various problems (for reference; Weighted Interval Scheduling, Sequence Alignment, Knapsack), their correctness and analysis.  Greedy Algorithms: Application to various problems, their correctness and analysis. | April (Week I, II)  April (Week III,IV)  April (Week IV, V) | Test Unit 3  Test Unit 4  Revision |

**References**

1. **Cormen, T.H., Leiserson,C.E. Rivest, R.L., & Stein, C.(2015). Introduction to Algorithms. 3rd edition. PHI.**
2. **Kleinberg, J., & Tardos, E. (2013). Algorithm Design. 1st edition. Pearson Education India.**

**Name of teacher: Neha Singh**

**Signature**