## Lesson Plan

Name of the Faculty: Er. Priyanaka Gulati Discipline: CSE Semester :4th Subject: Design and Analysis of Algorithms (PC-CS-208A) Lesson Plan Duration: 15 weeks (Feb-May 2024) \*\* Work (04 Lecture) per week (In Hours): Lecture -04, Practical:04

| Week | Lecture | Topic (including assignment/test) (In Each Section ) | Practical       | Торіс   |  |
|------|---------|--|-----------------|---|--|
|      | Day     |  | Day             |   |  |
| 1    | 1       | Unit :1ElementaryData structure                      | 1 <sup>st</sup> | To implement the quick                        |  |
|      | 2       | Algorithms and itscomplexity                         |                 | sort program                                  |  |
|      | 3       | Analysis Algorithms                                  |                 |   |  |
|      | 4       | Asymptotic Notations                                 |                 |   |  |
| 2    | 1       | Priority Queue                                       |                 | To implement merge                            |  |
|      | 2       | Quick Sort   | 2nd             | Sort  |  |
|      | 3       | Quick Sort   |                 |   |  |
|      | 4       | Recurrence Relation                                  |                 |   |  |
| 3    | 1       | Substitution method                                  |                 | To Find the longest                           |  |
|      | 2       | Recursion Tree                                       | _               | common subsequence                            |  |
|      | 3       | Master Theoram                                       | 3rd             | using dynamic<br>Programming                  |  |
|      | 4       | Revision   |                 |   |  |
| 4    | 1       | Unit :2 DynamicProgramming                           | 4th             | To implement Matrix                           |  |
|      | 2       | Matrix Chain Multiplication                          |                 | Chain Multiplication                          |  |
|      | 3       | Revision   | _               | -   |  |
|      | 4       | Longest CommonSubsequence                            |                 |   |  |
| 5    | 1       | Greedy Algorithm & Greedy Elements                   |                 | Use divide and conquer methods to recursively |  |
|      | 2       | Activity Selection Problem                           | 5th             |   |  |
|      | 3       | Huffman Codes  |                 | implementBinary                               |  |
|      | 4       | Task Scheduling Problem                              | _               | Search.                                       |  |
| 6    | 1       | Task Scheduling Problem                              |                 | To find the optimal                           |  |
|      | 2       | Revision   | 6th             | solution for Travelling                       |  |
|      | 3       | Travelling Salesman Problem                          |                 | Salesperson Problem.                          |  |
|      | 4       | Travelling Salesman Problem                          |                 | 1   |  |
| 7    | 1       | Unit :3 Review of Graph Algorithms: Traversal        | 7th             | Viva -voce                                    |  |
|      | 2       | Traversal Method, Breadth First Search               | _               |   |  |
|      | 3       | Depth First Search                                   |                 |   |  |
|      | 4       | Topological Sort                                     |                 |   |  |
| 8    | 1       | Revision   | 8th             | To implement BFS.                             |  |
|      | 2       | Introduction of Minimum Spanning                     | _               | 1   |  |
|      |         | Trees  |                 |   |  |
|      | 3       | Kruskal and Prims                                    | _               |   |  |
| 0    | 4       | Revision   | 041             | X7:   |  |
| ,    | 2       | Single Source Shortest Path                          | - 9th           | viva -voce                                    |  |
|      | 3       | Relaxation,  | _               |   |  |
|      |         | Dijkastra Algorithm                                  |                 |   |  |
|      | 4       | Relaxation,  |                 |   |  |
|      |         | Dijkastra Algorithm                                  |                 |   |  |
| 10   | 1       | Kevision   | -               |   |  |
|      | 2       | Bellman-Ford Algorithm                               |                 |   |  |
|      | 3       | All pairs- Shortest Paths and multiplication         | 1               |   |  |

|    | 4 | Floyd – Warshall Algorithm               |      |            |
|----|---|--|------|------------|
| 11 | 1 | Floyd – Warshall Algorithm               | 10th | Viva -voce |
|    | 2 | Revision                                 |      |            |
|    | 3 | Computational                            |      |            |
|    |   | Complexity ; Basic concept               |      |            |
|    | 4 | Polynomial Vs Non- Polynomial Complexity |      |            |
| 12 | 1 | Polynomial Vs Non- Polynomial Complexity |      |            |
|    | 2 | Ford Fulkerson Method                    |      |            |
|    | 3 | Revision                                 |      |            |
|    | 4 | Revision                                 |      |            |
| 13 | 1 | All pairs- Shortest Paths and matrix     |      |            |
|    |   | multiplication                           |      |            |
|    | 2 | Sorting and Merging Network              |      |            |
|    | 3 | Bitonic Networks                         |      |            |
|    | 4 | Revision                                 |      |            |
| 14 | 1 | Computational                            |      |            |
|    |   | Complexity ; Basic concept               |      |            |
|    | 2 | Polynomial Vs Non- Polynomial Complexity |      |            |
|    | 3 | Polynomial Vs Non- Polynomial Complexity |      |            |
|    | 4 | NP- Hard and NP- complete                |      |            |
| 15 | 1 | NP- Hard and NP- complete                |      |            |
|    | 2 | Revision                                 |      |            |
|    | 3 | Revision                                 |      |            |
|    | 4 | Revision                                 |      |            |

| 14 | 1 |                  | NA | NA |
|----|---|------------------|----|----|
|    | 2 |                  |    |    |
|    | 3 |                  |    |    |
|    | 4 |                  |    |    |
| 15 | 1 |                  | NA | NA |
|    | 2 |                  |    |    |
|    | 3 |                  |    |    |
|    | 4 | Sessional Test-3 |    |    |

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