



## SYNERGY SCHOOL OF ENGINEERING, DHENKANAL

### Lesson Plan

Sessions: 2026-27

|                                                            |                                                 |                                                              |
|------------------------------------------------------------|-------------------------------------------------|--------------------------------------------------------------|
| <b>Discipline:</b><br>Computer Science<br>and Engineering  | <b>Semester:</b> 3 <sup>rd</sup><br>Winter/2025 | <b>Name of the Faculty:</b><br>Asmita Pranayani              |
| <b>Subject:</b> Algorithms<br><b>Code No:</b><br>CSEPC 209 | <b>No. Of</b><br><b>Days/Week:</b> 03           | <b>Start Date:</b> 01/07/2026<br><b>End Date:</b> 05/11/2026 |

| Week | Class | Theory Topics                                                                                   |
|------|-------|-------------------------------------------------------------------------------------------------|
| 1st  | 1st   | Definition of algorithm                                                                         |
|      | 2nd   | Criteria of algorithms – Input/output, finiteness, definiteness, effectiveness,                 |
|      | 3rd   | writing an algorithm with pseudo code, algorithms and programs                                  |
| 2nd  | 1st   | Algorithmic Complexity: Concept of algorithmic complexity                                       |
|      | 2nd   | space complexity, Big-O notation,                                                               |
|      | 3rd   | Time complexity, worst case, average case and best-case analysis,                               |
| 3rd  | 1st   | Big-O notation, Finding the complexity of an algorithm                                          |
|      | 2nd   | Recursive algorithms: Concept of iteration and recursion,                                       |
|      | 3rd   | Examples of recursive algorithms – Fibonacci series, factorial.                                 |
| 4th  | 1st   | Tower-of-Hanoi problem.                                                                         |
|      | 2nd   | Complexities of recursive algorithms, conversion of recursive algorithm to iterative algorithm. |
|      | 3rd   | Algorithm Paradigms: Greedy,                                                                    |
| 5th  | 1st   | Divide and Conquer.                                                                             |
|      | 2nd   | Branch and Bound.                                                                               |
|      | 3rd   | Dynamic Programming and Backtracking.                                                           |

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|------|-----|--------------------------------------------------------|
| 6th  | 1st | Sorting: The sorting problem.                          |
|      | 2nd | Bubble sort,                                           |
|      | 3rd | Selection sort                                         |
| 7th  | 1st | Insertion sort,                                        |
|      | 2nd | Merge sort,                                            |
|      | 3rd | Quick sort,                                            |
| 8th  | 1st | Heap sort,                                             |
|      | 2nd | Radix sort. Searching: Symbol Tables,                  |
|      | 3rd | Binary Search Trees,                                   |
| 9th  | 1st | Balanced Search Trees.                                 |
|      | 2nd | Hashing, Hash Tables.                                  |
|      | 3rd | Graphs: Definition of a directed and undirected graph. |
| 10th | 1st | Paths                                                  |
|      | 2nd | Cycles, spanning trees                                 |
|      | 3rd | Directed Acyclic Graphs.                               |
| 11th | 1st | Topological Sorting. Minimum Spanning Tree algorithms, |
|      | 2nd | Shortest Path algorithms: Dijkstra's algorithm         |
|      | 3rd | Flow-based algorithms.                                 |
| 12th | 1st | Practice problems                                      |
|      | 2nd | Previous year question paper discussion                |
|      | 3rd | Mock viva preparation                                  |
| 13th | 1st | Doubt clearing session                                 |
|      | 2nd | Monthly Class Test-01                                  |
|      | 3rd | Previous year question paper discussion                |
| 14th | 1st | Doubt clearing session                                 |
|      | 2nd | Mock viva preparation                                  |
|      | 3rd | Doubt clearing session                                 |
| 15th | 1st | Monthly Class Test-02                                  |
|      | 2nd | Doubt clearing session                                 |
|      | 3rd | Quiz Test                                              |

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