

# Vidyavardhaka Sangha®, Mysore **VIDYAVARDHAKA COLLEGE OF ENGINEERING**

Autonomous Institute, affiliated to Visvesvaraya Technological University, Belagavi  
(Approved by AICTE, New Delhi & Government of Karnataka)

Accredited by NBA (CV, CS, EE, EC, IS & ME) | NAAC with 'A' Grade

P.B. No. 206, Gokulam III Stage, Mysuru-570 002, Karnataka, India

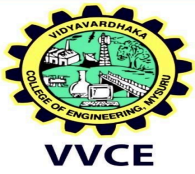
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 @vvceofficial

SEMESTER – VI		
Course Name	: Technical Proficiency Enhancement Course 4 For ECE, EEE, ME and Civil Branch	Course Code :
Number of Lecture Hours / Week	: 02	CIE Marks : 50
Number of Tutorial / Practical Hours / Week	:	SEE Marks : 50
Total Number of Lecture + Tutorial/Practical Hours	: 30	SEE Duration : 03 Hours
L:T:P	:	CREDITS : 03
COURSE PREREQUISITES: Working knowledge of C and C++ Programming		
<b>COURSE OVERVIEW:</b> This course is designed to enhance an individual's problem-solving, analytical, and critical thinking skills. It is often a crucial component of career development, competitive exams, and job recruitment processes.		
<b>COURSE LEARNING OBJECTIVES (CLO) :</b> <ol style="list-style-type: none"> <li>1. Develop Problem Solving Skills.</li> <li>2. Enhance Technical Skills.</li> <li>3. Prepare students for job recruitment process and competitive exams.</li> </ol>		
MODULES		TEACHING HOURS
<b>MODULE 1: Advanced Data Structures 1</b> <b>Priority Queues:</b> Introduction to Priority Queues, Ways to implement priority queues, Introduction to heaps, Introduction to Complete Binary Trees and its implementation, Insert and Delete operations in heaps, Implementing priority queues, Heap sort, Inbuilt Priority Queue.		6
<b>MODULE 2: Advanced Data Structures 2</b>		6



**Hashmaps:** Introduction to Hashmaps, Inbuilt Hashmap, Hash functions, Collision handling, Insert and Delete operation implementation in hashmap, Load factor, Rehashing.

### MODULE 3: Advanced Data Structures 3

**Tries:** Introduction to Tries, Making a Trie Node class, Insert, Search and Remove operation implementation in Tries, Types of Tries, Huffman coding.

**Graphs:** Introduction to Graphs, Graph Terminology, Graph implementation, Graph Traversals (DFS and BFS), Weighted and Directed Graphs, Minimum Spanning Trees, Cycle Detection in Graphs, Kruskal's algorithm, Prim's Algorithm, Dijkstra's algorithm.

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### MODULE 4: Dynamic Programming 1

**Introduction to Dynamic Programming:** Introduction to Memoization, Introduction to Dynamic Programming, Fibonacci numbers using recursion, memoization and dynamic programming.

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### MODULE 5: Dynamic Programming 2

**Applications of Dynamic Programming:** Longest Common Subsequence (LCS) using recursion, memoization and dynamic programming, Edit distance using recursion, memoization and dynamic programming, Knapsack problem using recursion, memoization and dynamic programming.

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### Textbooks:

1.

### Reference Books:

1. Data Structures and Algorithms Made Easy by Narasimha Karumanchi
2. Data Structures through C in Depth by S K Srivastava and Deepali Srivastava

### COURSE OUTCOMES (COs):

**Upon completion of the course, students will be able to**

**CO1**

Students will be able to analyze and solve complex problems efficiently using logical and structured approaches.

**CO2**

Students will develop critical thinking skills, enabling them to evaluate information and make sound decisions.

