

**COURSE TITLE: PROGRAMMING CONCEPTS LAB****COURSE OBJECTIVES:**

- Identify the way of implementation algorithms required for sorting searching, sorting array
- Identify the method of implementation of graph related algorithms

**LEARNING OUTCOMES:**

The students will be able to:

- Understand the concept of implementation of various algorithms
- Understand the measuring of performance values of various algorithms

Code	Course	Teaching Period / Week		Credit			Duration of Theory Exam (in Hrs.)
		L	Pr./Tu	Int.	Ext.	Total	
MCSL104	Programming Concepts Lab	-	2	1	1	2	1

Module No	Objective	Content	Evaluation
1	To implement sorting algorithms	<b>Implementation of Sorting Algorithms</b> Insertion sort, Bubble Sort, Selection Sort, Shell Sort	Students will be evaluated using Lab Manual. (Marks 5)
2	To implement divide and conquer method-based algorithms	<b>Implementation of Algorithms based on divide and conquer</b> Quick sort implementation, Binary search algorithm	Class Test (Marks 10)
3	To implement shortest path and minimum spanning tree algorithm	<b>Implementation of MST and Shortest path algorithm</b> Find Minimum Cost Spanning Tree of a given undirected graph using Kruskal's algorithm, from a given vertex in a weighted connected graph, find shortest paths to other vertices using Dijkstra's algorithm.	
4	To implement graph traversal algorithms	<b>Implementation of Graph Algorithms</b> Traverse a graph using Breadth-first search, Depth-first search	Practical Exam will be conducted. (Marks 10)
Programming Language: C/C++			

**EVALUATION:**

<b>Evaluation</b>	<b>Details</b>	<b>Marks</b>
(* please give details of assessment in terms of Unit test/ Project/ quiz /or other assignments and marks allotted for it)		
Internal	<ul style="list-style-type: none"> <li>• Lab Manuals</li> <li>• Class Test</li> <li>• Practical Test</li> </ul>	25 Marks
External	<b>Final Examination (Practical)</b>	25 Marks
<b>Total marks</b>		<b>50 Marks</b>

**TEXT BOOKS:**

- 1) Narasimha Karumanchi, (2016), *Data Structures and Algorithms Made Easy: Data Structures and Algorithmic Puzzles*, CareerMonk Publications
- 2) Dorothy Graham, E. P. (2006). *Foundations of Software Testing: ISTQB Certification*. USA: 2006.
- 3) James F. Kurose, K. W. (2007). *Computer Networking: A Top-down Approach Featuring the Internet*. USA: Pearson/Addison Wesley.

**REFERENCE BOOKS:**

- 1) Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, (2009), *Introduction to Algorithms*, Third Edition, PHI Learning Pvt. Ltd-New Delhi
- 2) Sanjoy Dasgupta, Christos H. Papadimitriou, Umesh Vazirani, (2006), *Algorithms*, McGraw-Hill Higher Education
- 3) *Grokking Algorithms: An illustrated guide for programmers and other curious people*, MEAP, Aditya Bhargava, <http://www.manning.com/bhargava>