GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. Semester: I

Signal Processing and VLSI Technology(EC)

Subject Name: **Foundation of VLSI CAD (Major Elective – I)**

Sr.No	Course content
1.	**Matrices:** Linear dependence of vectors, solution of linear equations, bases of vector spaces, orthogonality, complementary orthogonal spaces and solution spaces of linear equations.
2.	**Graphs:** representation of graphs using matrices; Paths, connectedness; circuits, cutsets, trees; Fundamental circuit and cutset matrices; Voltage and current spaces of a directed graph and their complementary orthogonality.
3.	**Algorithms and data structures:** efficient representation of graphs; Elementary graph algorithms involving bfs and dfs trees, such as finding connected and 2- connected components of a graph, the minimum spanning tree, shortest path between a pair of vertices in a graph; Data structures such as stacks, linked lists and queues, binary trees and heaps. Time and space complexity of algorithms.

Reference Books:

1. K. Hoffman and R.E. Kunze, Linear Algebra, Prentice Hall (India)
2. N.Balabanian and T.A. Bickart, Linear Network Theory : Analysis, Properties, Design and Synthesis, Matrix Publishers, Inc.
3. T.Cormen, C.Leiserson and R.A.Rivest, Algorithms, MIT Press and McGraw-Hill