**MA\*731 Graph Theory and Algorithms**

Introduction to graphs and its applications, Basics of paths, Cycles, and Trails, Connection, Bipartite Graphs, Eulerian circuits, Vertex degrees and counting, Degree-sum fromula, The Chinese postmean problem and graphic sequences. Trees and distance, Properties of trees, Spanning trees and enumeration, Matirx tree computation, Cayley's formula. Matiching and covers, Hall's condition, Min-Max theorm, Independent sets, Covers and maximum Bipartite matching, Hungarian algorithm. Stable matiching and faster bipartite matching, Factors and perfect matiching in general graphs. Connectivity and paths, Cuts and connectivity, k connected graphs, Network flow Ford-Fulkerson labeling algorithm, Max-Flow Min-cut theorem, Menger's proof using Max-Flow Min-Cut Theorem. Vertex coloring. Plannar Graphs, Characterization of planar graphs, Kuratowski's theorm, Wagner's theorem.

**References:**

1. Narsingh Deo, Graph theory, Prentice Hall India, 2008.
2. H. Cormen, C. E. Leiserson and R. L. Rivest, “Introduction to Algorithms,” McGraw-Hill, 2007
3. Baase, Computer algorithms, Pearson India 2008.