Course No.	Course Name	L	T	P	C
CSC503	**ALGORITHMIC GRAPH THEORY(40 Lectures)**	3	0	0	9

UNIT 1 (3 lectures): Graphs and algorithmic complexity, graph representation, graph traversals;
UNIT 2 (4 lectures):Spanning trees, branching, connectivity, circuits, cut-sets;
UNIT 3 (5 lectures):Planar graphs: genus, crossing numbers, thickness, characterization of planarity, planarity testing
UNIT 4 (6 lectures):Networks and flows: Menger's theorem, maximizing flow in graph networks, minimum cost flow;
UNIT 5 (6 lectures): Matching: maximum cardinality matching, maximum weight matching, perfect matching;
UNIT 6 (6 lectures): Euler tours and Hamiltonian cycles: counting Eulerian tours, finding all Hamiltonian cycles using matricial products, 2-factors
UNIT 7 (5 lectures): Graph coloring: dominating set, edge coloring, vertex coloring, chromatic polynomial, face coloring, 4-color theorem, 5-color theorem;
UNIT 8 (5 lectures): Graph problems and intractability: Cook's theorem, vertex covering, independent sets and cliques

Course Objective: Development of concepts of algorithms related to graphs

Outcome: Students are expected to be able to handle the combinatorial and graph problems with greater ease.

Text Books:

1. Algorithmic Graph Theory by Alan Gibbons,, Cambrige University Press

Reference Books:

1.Algorithmic Graph Theory and Perfect Graphs by Martin Charles Golumbic, North Holland
2.Graph Theoretic Algorithms, Therese Biedl, U of Waterloo
3.Advanced Topics in Graph Algorithms, Ron Shamir, Tel Aviv U.