

III YEAR SEM-II B.Tech CSE	ELECTIVE	L	T	P	C
CODE: CS3603	Applied Graph Theory	2	2	0	4

Course Objective:

- Be familiar with the most fundamental Graph Theory topics and results.
- Be exposed to the techniques of proofs and analysis

Syllabus:

Unit I

TREES, CONNECTIVITY & PLANARITY

Spanning trees – Fundamental circuits – Spanning trees in a weighted graph – cut sets – Properties of cut set – All cut sets – Fundamental circuits and cut sets – Connectivity and separability –

UNIT II

Network flows Problems – 1-Isomorphism – 2-Isomorphism – Combinational and geometric graphs – Planer graphs – Different representation of a planer graph.

Unit III

MATRICES, COLOURING AND DIRECTED GRAPH

Chromatic number – Chromatic partitioning – Chromatic polynomial – Matching – Covering – Four color problem – Directed graphs – Types of directed graphs – Digraphs and binary relations – Directed paths and connectedness – Euler graphs.

UNIT-IV:

Graph Data Management, Indexes, Graph Partitioning, Query Processing, Enumeration of Subgraphs.

Unit V

Social network Analysis- Social Network as Graphs, Topology Identification in Social Networks, Community Detection in Social Network.

Text books:

1. Narsingh Deo, “Graph Theory: With Application to Engineering and Computer Science”, Prentice Hall of India, 2003.
2. Grimaldi R.P. “Discrete and Combinatorial Mathematics: An Applied Introduction”, Addison Wesley, 1994.

REFERENCES:

1. Clark J. and Holton D.A, “A First Look at Graph Theory”, Allied Publishers, 1995.
2. Mott J.L., Kandel A. and Baker T.P. “Discrete Mathematics for Computer Scientists and Mathematicians”, Prentice Hall of India, 1996.
3. Liu C.L., “Elements of Discrete Mathematics”, Mc Graw Hill, 1985.
4. Rosen K.H., “Discrete Mathematics and Its Applications”, Mc Graw Hill, 2007.

Video Reference links:

Title	Expert Name	Details of Expert	Web link
Lecture series on graph theory	Prof L.Sunil Chandran	Department of Computer Science and Automation, IIScBangalore	http://nptel.ac.in/courses/106108054/