

MATH 5301

Introduction to Discrete Structures

- 1-Graphs, Directed graphs, Basic definitions, Isomorphism of graphs, Subgraphs.
- 2- Paths and cycles, Matrix representation of graphs, Connectedness, Bridges, Cut vertices.
- 3-Trees, Spanning trees.
- 4- Eulerian circuits, Hamiltonian cycles, Weighted graphs and minimum spanning trees, shortest paths.
- 5-Tournaments, Applications.
- 6-Planar graphs, Euler's Formula, Kuratowski's theorem.
- 7-Graph coloring, Vertex coloring, Edge coloring, Map coloring, Chromatic polynomials.
- 8-Ordered sets, Comparability and covering graphs, Dilworth theorem, Block designs.
- 9- Latin squares, Orthogonal Latin squares.
- 10- Finite geometries, Basic definitions and properties.

Textbook: GRAPH THEORY WITH APPLICATIONS

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