

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Graph Theory

Subject Co-ordinator - Dr. L. Sunil Chandran

Co-ordinating Institute - IISc - Bangalore

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Matchings
- Lecture 3 - More on Hall's theorem and some applications
- Lecture 4 - Tutte's theorem on existence of a perfect matching
- Lecture 5 - More on Tutte's theorem
- Lecture 6 - More on Matchings
- Lecture 7 - Dominating set, path cover
- Lecture 8 - Gallai's Millgram theorem, Dilworth's theorem
- Lecture 9 - Connectivity
- Lecture 10 - Menger's theorem
- Lecture 11 - More on connectivity
- Lecture 12 - Minors, topological minors and more on k-linkedness
- Lecture 13 - Vertex coloring
- Lecture 14 - More on vertex coloring
- Lecture 15 - Edge coloring
- Lecture 16 - Proof of Vizing's theorem, Introduction to planarity
- Lecture 17 - 5-coloring planar graphs, Kuratowski's theorem
- Lecture 18 - Proof of Kuratowski's theorem, List coloring
- Lecture 19 - List chromatic index
- Lecture 20 - Adjacency polynomial of a graph and combinatorial Nullstellensatz
- Lecture 21 - Chromatic polynomial, k-critical graphs
- Lecture 22 - Gallai-Roy theorem, Acyclic coloring, Hadwiger's conjecture
- Lecture 23 - Perfect graphs
- Lecture 24 - Interval graphs, chordal graphs
- Lecture 25 - Proof of weak perfect graph theorem (WPGT)
- Lecture 26 - Second proof of WPGT, Some non-perfect graph classes
- Lecture 27 - More special classes of graphs
- Lecture 28 - Boxicity, Sphericity, Hamiltonian circuits
- Lecture 29 - More on Hamiltonicity

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- Lecture 30 - Chvatal's theorem, toughness, Hamiltonicity and 4-color conjecture
- Lecture 31 - Network flows
- Lecture 32 - More on network flows
- Lecture 33 - Circulations and tensions
- Lecture 34 - More on circulations and tensions, flow number and Tutte's flow conjectures
- Lecture 35 - Random graphs and probabilistic method
- Lecture 36 - Probabilistic method
- Lecture 37 - Probabilistic method
- Lecture 38 - Probabilistic method
- Lecture 39 - Graph minors and Hadwiger's conjecture
- Lecture 40 - More on graph minors, tree decompositions