

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

NPTEL Video Course - Mathematics - NOC:Algebraic Combinatorics

Subject Co-ordinator - Prof. Amritanshu Prasad, Prof. Sankaran Viswanath

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Examples of Mobius Inversion
- Lecture 2 - Partially Ordered Sets
- Lecture 3 - Hasse Diagrams
- Lecture 4 - Isomorphisms of Posets
- Lecture 5 - Maximal, Minimal, Greatest, Least
- Lecture 6 - Induced Subposets
- Lecture 7 - Incidence Algebras
- Lecture 8 - Inversion in Incidence Algebras
- Lecture 9 - Mobius Inversion
- Lecture 10 - Examples of Mobius Functions
- Lecture 11 - Product Posets and their Mobius Functions
- Lecture 12 - Opposite of a Poset
- Lecture 13 - The Poset of Set Partitions
- Lecture 14 - Connected Structures
- Lecture 15 - Lattices
- Lecture 16 - Weisner's Theorem
- Lecture 17 - The Lattice of Non-Crossing Partitions
- Lecture 18 - The Canonical Product Decomposition for Intervals of Non-Crossing Partitions
- Lecture 19 - The Mobius Function for Non-Crossing Partitions
- Lecture 20 - Ideals in a Poset
- Lecture 21 - Mobius Function of $J(P)$
- Lecture 22 - Young's Lattice
- Lecture 23 - Distributive Lattices
- Lecture 24 - Formal Power Series
- Lecture 25 - The Necklace Problem
- Lecture 26 - Combinatorial Classes
- Lecture 27 - Sums, Products, and Sequences of Combinatorial Classes
- Lecture 28 - Power Set, Multisets, and Sequences
- Lecture 29 - A Little Dendrology

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- Lecture 30 - Super Catalan/Little Schroeder numbers
- Lecture 31 - Regular Languages
- Lecture 32 - Finite Automata
- Lecture 33 - The Pumping Lemma
- Lecture 34 - The Dyck Language
- Lecture 35 - Permutations and their cycles
- Lecture 36 - Permutation Groups
- Lecture 37 - Orbits, fixed points, stabilizers
- Lecture 38 - The orbit counting theorem
- Lecture 39 - The Polya Enumeration Theorem
- Lecture 40 - The Cycle Index Polynomials
- Lecture 41 - Cycle Index of the Octahedral Group
- Lecture 42 - Cycle Index of the Full Permutation Group
- Lecture 43 - Combinatorial Species
- Lecture 44 - Generating Series of a Species
- Lecture 45 - Cycle Index Series of a Species
- Lecture 46 - Isomorphism of Species
- Lecture 47 - Visualization of Species
- Lecture 48 - Sum of Species
- Lecture 49 - Product of Species
- Lecture 50 - Sums and Products: More Examples
- Lecture 51 - Substitution of Species
- Lecture 52 - Derivative of a Species
- Lecture 53 - Powers and Sequences of Binomial Type
- Lecture 54 - Pointing and Cayley's Theorem
- Lecture 55 - R-enriched Trees
- Lecture 56 - R-enriched Endofunctions
- Lecture 57 - Lagrange Inversion Formula
- Lecture 58 - Motivation for the LGV Lemma
- Lecture 59 - Statement of the LGV Lemma
- Lecture 60 - Nice Applications of the LGV Lemma
- Lecture 61 - Sign-Reversing Involutions
- Lecture 62 - Proof of the LGV Lemma
- Lecture 63 - The Cauchy-Binet Formula
- Lecture 64 - Symmetric polynomials: definition and examples
- Lecture 65 - Monomial symmetric polynomials
- Lecture 66 - Elementary and Complete symmetric polynomials - Part 1
- Lecture 67 - Elementary and Complete symmetric polynomials - Part 2
- Lecture 68 - Alternating polynomials

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- Lecture 69 - Labelled abaci and alternants
- Lecture 70 - Schur polynomials
- Lecture 71 - Pieri Rule - Statement and Examples
- Lecture 72 - Pieri Rule - Proof
- Lecture 73 - The second Pieri rule
- Lecture 74 - Semi-standard tableaux
- Lecture 75 - Triangularity of Kostka matrix
- Lecture 76 - Monomial expansion of Schur
- Lecture 77 - The RSK correspondence
- Lecture 78 - Jacobi Trudi identities via LGV lemma
- Lecture 79 - Formal ring of symmetric functions in infinitely many variables
- Lecture 80 - Monomial expansions and RSK
- Lecture 81 - Generating functions for e , h
- Lecture 82 - The power sum symmetric functions
- Lecture 83 - The inner product and Cauchy identity
- Lecture 84 - Skew Schur functions and the LR rule