

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

NPTEL Video Course - Mathematics - Elementary Numerical Analysis

Subject Co-ordinator - Prof. Rekha P. Kulkarni

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Introduction
Lecture 2 - Polynomial Approximation
Lecture 3 - Interpolating Polynomials
Lecture 4 - Properties of Divided Difference
Lecture 5 - Error in the Interpolating polynomial
Lecture 6 - Cubic Hermite Interpolation
Lecture 7 - Piecewise Polynomial Approximation
Lecture 8 - Cubic Spline Interpolation
Lecture 9 - Tutorial 1
Lecture 10 - Numerical Integration
Lecture 11 - Composite Numerical Integration
Lecture 12 - Gauss 2-point Rule
Lecture 13 - Gauss 2-point Rule
Lecture 14 - Convergence of Gaussian Integration
Lecture 15 - Tutorial 2
Lecture 16 - Numerical Differentiation
Lecture 17 - Gauss Elimination
Lecture 18 - L U decomposition
Lecture 19 - Cholesky decomposition
Lecture 20 - Gauss Elimination with partial pivoting
Lecture 21 - Vector and Matrix Norms
Lecture 22 - Perturbed Linear Systems
Lecture 23 - Ill-conditioned Linear System
Lecture 24 - Tutorial 3
Lecture 25 - Effect of Small Pivots
Lecture 26 - Solution of Non-linear Equations
Lecture 27 - Quadratic Convergence of Newton's Method
Lecture 28 - Jacobi Method
Lecture 29 - Gauss-Seidel Method

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Tutorial 4
- Lecture 31 - Initial Value Problem
- Lecture 32 - Multi-step Methods
- Lecture 33 - Predictor-Corrector Formulae
- Lecture 34 - Boundary Value Problems
- Lecture 35 - Eigenvalues and Eigenvectors
- Lecture 36 - Spectral Theorem
- Lecture 37 - Power Method
- Lecture 38 - Inverse Power Method
- Lecture 39 - Q R Decomposition
- Lecture 40 - Q R Method

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

NPTEL Video Course - Mathematics - Measure and Integration

Subject Co-ordinator - Prof. Inder K Rana

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Introduction, Extended Real numbers
- Lecture 2 - Algebra and Sigma Algebra of a subset of a set
- Lecture 3 - Sigma Algebra generated by a class
- Lecture 4 - Monotone Class
- Lecture 5 - Set function
- Lecture 6 - The Length function and its properties
- Lecture 7 - Countably additive set functions on intervals
- Lecture 8 - Uniqueness Problem for Measure
- Lecture 9 - Extension of measure
- Lecture 10 - Outer measure and its properties
- Lecture 11 - Measurable sets
- Lecture 12 - Lebesgue measure and its properties
- Lecture 13 - Characterization of Lebesgue measurable sets
- Lecture 14 - Measurable functions
- Lecture 15 - Properties of measurable functions
- Lecture 16 - Measurable functions on measure spaces
- Lecture 17 - Integral of non negative simple measurable functions
- Lecture 18 - Properties of non negative simple measurable functions
- Lecture 19 - Monotone convergence theorem & Fatou's Lemma
- Lecture 20 - Properties of Integral functions & Dominated Convergence Theorem
- Lecture 21 - Dominated Convergence Theorem and applications
- Lecture 22 - Lebesgue Integral and its properties
- Lecture 23 - Denseness of continuous function
- Lecture 24 - Product measures, an Introduction
- Lecture 25 - Construction of Product Measure
- Lecture 26 - Computation of Product Measure - I
- Lecture 27 - Computation of Product Measure - II
- Lecture 28 - Integration on Product spaces
- Lecture 29 - Fubini's Theorems

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Lebesgue Measure and integral on \mathbb{R}^2
- Lecture 31 - Properties of Lebesgue Measure and integral on \mathbb{R}^n
- Lecture 32 - Lebesgue integral on \mathbb{R}^2
- Lecture 33 - Integrating complex-valued functions
- Lecture 34 - L_p - spaces
- Lecture 35 - $L^2(X, S, \mu)$
- Lecture 36 - Fundamental Theorem of calculus for Lebesgue Integral - I
- Lecture 37 - Fundamental Theorem of calculus for Lebesgue Integral - II
- Lecture 38 - Absolutely continuous measures
- Lecture 39 - Modes of convergence
- Lecture 40 - Convergence in Measure

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

NPTEL Video Course - Mathematics - Mathematics in India - From Vedic Period to Modern Times

Subject Co-ordinator - Prof. M.D. Srinivas, Prof. K. Ramasubramanian, Prof. M.S. Sriram

Co-ordinating Institute - Centre for Policy Studies, Chennai | IIT - Bombay | University of Madras, Chennai

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

- Lecture 1 - Indian Mathematics
- Lecture 2 - Vedas and Sulbasutras - Part 1
- Lecture 3 - Vedas and Sulbasutras - Part 2
- Lecture 4 - Panini's Astadhyayi
- Lecture 5 - Pingala's Chandahsastra
- Lecture 6 - Decimal place value system
- Lecture 7 - Aryabhata's Aryabhata - Part 1
- Lecture 8 - Aryabhata's Aryabhata - Part 2
- Lecture 9 - Aryabhata's Aryabhata - Part 3
- Lecture 10 - Aryabhata's Aryabhata - Part 4 and Introduction to Jaina Mathematics
- Lecture 11 - Brahmasphutasiddhanta of Brahmagupta - Part 1
- Lecture 12 - Brahmasphutasiddhanta of Brahmagupta - Part 2
- Lecture 13 - Brahmasphutasiddhanta of Brahmagupta - Part 3
- Lecture 14 - Brahmasphutasiddhanta of Brahmagupta - Part 4 and The Bakhshali Manuscript
- Lecture 15 - Mahavira's Ganitasarasangraha - Part 1
- Lecture 16 - Mahavira's Ganitasarasangraha - Part 2
- Lecture 17 - Mahavira's Ganitasarasangraha - Part 3
- Lecture 18 - Development of Combinatorics - Part 1
- Lecture 19 - Development of Combinatorics - Part 2
- Lecture 20 - Lilavati of Bhaskaracarya - Part 1
- Lecture 21 - Lilavati of Bhaskaracarya - Part 2
- Lecture 22 - Lilavati of Bhaskaracarya - Part 3
- Lecture 23 - Bijaganita of Bhaskaracarya - Part 1
- Lecture 24 - Bijaganita of Bhaskaracarya - Part 2
- Lecture 25 - Ganitakaumudi of Narayana Pandita - Part 1
- Lecture 26 - Ganitakaumudi of Narayana Pandita - Part 2
- Lecture 27 - Ganitakaumudi of Narayana Pandita - Part 3
- Lecture 28 - Magic Squares - Part 1
- Lecture 29 - Magic Squares - Part 2

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Development of Calculus in India - Part 1
- Lecture 31 - Development of Calculus in India - Part 2
- Lecture 32 - Jyanayanam
- Lecture 33 - Trigonometry and Spherical Trigonometry - Part 1
- Lecture 34 - Trigonometry and Spherical Trigonometry - Part 2
- Lecture 35 - Trigonometry and Spherical Trigonometry - Part 3
- Lecture 36 - Proofs in Indian Mathematics - Part 1
- Lecture 37 - Proofs in Indian Mathematics - Part 2
- Lecture 38 - Proofs in Indian Mathematics - Part 3
- Lecture 39 - Mathematics in Modern India - Part 1
- Lecture 40 - Mathematics in Modern India - Part 2

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

NPTEL Video Course - Mathematics - NOC:Measure Theory

Subject Co-ordinator - Prof. Inder K Rana

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - (1A) Introduction, Extended Real Numbers
- Lecture 2 - (1B) Introduction, Extended Real Numbers
- Lecture 3 - (2A) Algebra and Sigma Algebra of Subsets of a Set
- Lecture 4 - (2B) Algebra and Sigma Algebra of Subsets of a Set
- Lecture 5 - (3A) Sigma Algebra generated by a Class
- Lecture 6 - (3B) Sigma Algebra generated by a Class
- Lecture 7 - (4A) Monotone Class
- Lecture 8 - (4B) Monotone Class
- Lecture 9 - (5A) Set Functions
- Lecture 10 - (5B) Set Functions
- Lecture 11 - (6A) The Length Function and its Properties
- Lecture 12 - (6B) The Length Function and its Properties
- Lecture 13 - (7A) Countably Additive Set Functions on Intervals
- Lecture 14 - (7B) Countably Additive Set Functions on Intervals
- Lecture 15 - (8A) Uniqueness Problem for Measure
- Lecture 16 - (8B) Uniqueness Problem for Measure
- Lecture 17 - (9A) Extension of Measure
- Lecture 18 - (9B) Extension of Measure
- Lecture 19 - (10A) Outer Measure and its Properties
- Lecture 20 - (10B) Outer Measure and its Properties
- Lecture 21 - (11A) Measurable Sets
- Lecture 22 - (11B) Measurable Sets
- Lecture 23 - (12A) Lebesgue Measure and its Properties
- Lecture 24 - (12B) Lebesgue Measure and its Properties
- Lecture 25 - (13A) Characterization of Lebesgue Measurable Sets
- Lecture 26 - (13B) Characterization of Lebesgue Measurable Sets
- Lecture 27 - (14A) Measurable Functions
- Lecture 28 - (14B) Measurable Functions
- Lecture 29 - (15A) Properties of Measurable Functions

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - (15B) Properties of Measurable Functions
- Lecture 31 - (16A) Measurable Functions on Measure Spaces
- Lecture 32 - (16B) Measurable Functions on Measure Spaces
- Lecture 33 - (17A) Integral of Nonnegative Simple Measurable Functions
- Lecture 34 - (17B) Integral of Nonnegative Simple Measurable Functions
- Lecture 35 - (18A) Properties of Nonnegative Simple Measurable Functions
- Lecture 36 - (18B) Properties of Nonnegative Simple Measurable Functions
- Lecture 37 - (19A) Monotone Convergence Theorem and Fatou's Lemma
- Lecture 38 - (19B) Monotone Convergence Theorem and Fatou's Lemma
- Lecture 39 - (20A) Properties of Integrable Functions and Dominated Convergence Theorem
- Lecture 40 - (20B) Properties of Integrable Functions and Dominated Convergence Theorem
- Lecture 41 - (21A) Dominated Convergence Theorem and Applications
- Lecture 42 - (21B) Dominated Convergence Theorem and Applications
- Lecture 43 - (22A) Lebesgue Integral and its Properties
- Lecture 44 - (22B) Lebesgue Integral and its Properties
- Lecture 45 - (23A) Product Measure, an Introduction
- Lecture 46 - (23B) Product Measure, an Introduction
- Lecture 47 - (24A) Construction of Product Measures
- Lecture 48 - (24B) Construction of Product Measures
- Lecture 49 - (25A) Computation of Product Measure - I
- Lecture 50 - (25B) Computation of Product Measure - I
- Lecture 51 - (26A) Computation of Product Measure - II
- Lecture 52 - (26B) Computation of Product Measure - II
- Lecture 53 - (27A) Integration on Product Spaces
- Lecture 54 - (27B) Integration on Product Spaces
- Lecture 55 - (28A) Fubini's Theorems
- Lecture 56 - (28B) Fubini's Theorems
- Lecture 57 - (29A) Lebesgue Measure and Integral on \mathbb{R}^2
- Lecture 58 - (29B) Lebesgue Measure and Integral on \mathbb{R}^2
- Lecture 59 - (30A) Properties of Lebesgue Measure on \mathbb{R}^2
- Lecture 60 - (30B) Properties of Lebesgue Measure on \mathbb{R}^2
- Lecture 61 - (31A) Lebesgue Integral on \mathbb{R}^2
- Lecture 62 - (31B) Lebesgue Integral on \mathbb{R}^2

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

NPTEL Video Course - Mathematics - NOC:Calculus for Economics, Commerce and Management

Subject Co-ordinator - Prof.Inder Kumar Rana

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Introduction to the Course
- Lecture 2 - Concept of a Set, Ways of Representing Sets
- Lecture 3 - Venn Diagrams, Operations on Sets
- Lecture 4 - Operations on Sets, Cardinal Number, Real Numbers
- Lecture 5 - Real Numbers, Sequences
- Lecture 6 - Sequences, Convergent Sequences, Bounded Sequences
- Lecture 7 - Limit Theorems, Sandwich Theorem, Monotone Sequences, Completeness of Real Numbers
- Lecture 8 - Relations and Functions
- Lecture 9 - Functions, Graph of a Functions, Function Formulas
- Lecture 10 - Function Formulas, Linear Models
- Lecture 11 - Linear Models, Elasticity, Linear Functions, Nonlinear Models, Quadratic Functions
- Lecture 12 - Quadratic Functions, Quadratic Models, Power Function, Exponential Function
- Lecture 13 - Exponential Function, Exponential Models, Logarithmic Function
- Lecture 14 - Limit of a Function at a Point, Continuous Functions
- Lecture 15 - Limit of a Function at a Point
- Lecture 16 - Limit of a Function at a Point, Left and Right Limits
- Lecture 17 - Computing Limits, Continuous Functions
- Lecture 18 - Applications of Continuous Functions
- Lecture 19 - Applications of Continuous Functions, Marginal of a Function
- Lecture 20 - Rate of Change, Differentiation
- Lecture 21 - Rules of Differentiation
- Lecture 22 - Derivatives of Some Functions, Marginal, Elasticity
- Lecture 23 - Elasticity, Increasing and Decreasing Functions, Optimization, Mean Value Theorem
- Lecture 24 - Mean Value Theorem, Marginal Analysis, Local Maxima and Minima
- Lecture 25 - Local Maxima and Minima
- Lecture 26 - Local Maxima and Minima, Continuity Test, First Derivative Test, Successive Differentiation
- Lecture 27 - Successive Differentiation, Second Derivative Test
- Lecture 28 - Average and Marginal Product, Marginal of Revenue and Cost, Absolute Maximum and Minimum
- Lecture 29 - Absolute Maximum and Minimum

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Monopoly Market, Revenue and Elasticity
- Lecture 31 - Property of Marginals, Monopoly Market, Publisher v/s Author Problem
- Lecture 32 - Convex and Concave Functions
- Lecture 33 - Derivative Tests for Convexity, Concavity and Points of Inflection, Higher Order Derivative Conc
- Lecture 34 - Convex and Concave Functions, Asymptotes
- Lecture 35 - Asymptotes, Curve Sketching
- Lecture 36 - Functions of Two Variables, Visualizing Graph, Level Curves, Contour Lines
- Lecture 37 - Partial Derivatives and Application to Marginal Analysis
- Lecture 38 - Marginals in Cobb-Douglas model, partial derivatives and elasticity, chain rules
- Lecture 39 - Chain Rules, Higher Order Partial Derivatives, Local Maxima and Minima, Critical Points
- Lecture 40 - Saddle Points, Derivative Tests, Absolute Maxima and Minima
- Lecture 41 - Some Examples, Constrained Maxima and Minima

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

NPTEL Video Course - Mathematics - NOC:Basic Linear Algebra

Subject Co-ordinator - Prof.Inder Kumar Rana

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Introduction - I
- Lecture 2 - Introduction - II
- Lecture 3 - Introduction - III
- Lecture 4 - Systems of Linear Equations - I
- Lecture 5 - Systems of Linear Equations - II
- Lecture 6 - Systems of Linear Equations - III
- Lecture 7 - Reduced Row Echelon Form and Rank - I
- Lecture 8 - Reduced Row Echelon Form and Rank - II
- Lecture 9 - Reduced Row Echelon Form and Rank - III
- Lecture 10 - Solvability of a Linear System, Linear Span, Basis - I
- Lecture 11 - Solvability of a Linear System, Linear Span, Basis - II
- Lecture 12 - Solvability of a Linear System, Linear Span, Basis - III
- Lecture 13 - Linear Span, Linear Independence and Basis - I
- Lecture 14 - Linear Span, Linear Independence and Basis - II
- Lecture 15 - Linear Span, Linear Independence and Basis - III
- Lecture 16 - Row Space, Column Space, Rank-Nullity Theorem - I
- Lecture 17 - Row Space, Column Space, Rank-Nullity Theorem - II
- Lecture 18 - Row Space, Column Space, Rank-Nullity Theorem - III
- Lecture 19 - Determinants and their Properties - I
- Lecture 20 - Determinants and their Properties - II
- Lecture 21 - Determinants and their Properties - III
- Lecture 22 - Linear Transformations - I
- Lecture 23 - Linear Transformations - II
- Lecture 24 - Linear Transformations - III
- Lecture 25 - Orthonormal Basis, Geometry in \mathbb{R}^2 - I
- Lecture 26 - Orthonormal Basis, Geometry in \mathbb{R}^2 - II
- Lecture 27 - Orthonormal Basis, Geometry in \mathbb{R}^2 - III
- Lecture 28 - Isometries, Eigenvalues and Eigenvectors - I
- Lecture 29 - Isometries, Eigenvalues and Eigenvectors - II

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Isometries, Eigenvalues and Eigenvectors - III
- Lecture 31 - Diagonalization and Real Symmetric Matrices - I
- Lecture 32 - Diagonalization and Real Symmetric Matrices - II
- Lecture 33 - Diagonalization and Real Symmetric Matrices - III
- Lecture 34 - Diagonalization and its Applications - I
- Lecture 35 - Diagonalization and its Applications - II
- Lecture 36 - Diagonalization and its Applications - III
- Lecture 37 - Abstract Vector Spaces - I
- Lecture 38 - Abstract Vector Spaces - II
- Lecture 39 - Abstract Vector Spaces - III
- Lecture 40 - Inner Product Spaces - I
- Lecture 41 - Inner Product Spaces - II

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

NPTEL Video Course - Mathematics - NOC:Commutative Algebra

Subject Co-ordinator - Prof. Dilip P. Patil

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Zariski Topology and K-Spectrum

Lecture 2 - Algebraic Varieties and Classical Nullstellensatz

Lecture 3 - Motivation for Krull's Dimension

Lecture 4 - Chevalley's dimension

Lecture 5 - Associated Prime Ideals of a Module

Lecture 6 - Support of a Module

Lecture 7 - Primary Decomposition

Lecture 8 - Primary Decomposition (Continued...)

Lecture 9 - Uniqueness of Primary Decomposition

Lecture 10 - Modules of Finite Length

Lecture 11 - Modules of Finite Length (Continued...)

Lecture 12 - Introduction to Krull's Dimension

Lecture 13 - Noether Normalization Lemma (Classical Version)

Lecture 14 - Consequences of Noether Normalization Lemma

Lecture 15 - Nil Radical and Jacobson Radical of Finite type Algebras over a Field and digression of Integral

Lecture 16 - Nagata's version of NNL

Lecture 17 - Dimensions of Polynomial ring over Noetherian rings

Lecture 18 - Dimension of Polynomial Algebra over arbitrary Rings

Lecture 19 - Dimension Inequalities

Lecture 20 - Hilbert's Nullstellensatz

Lecture 21 - Computational rules for Poincaré Series

Lecture 22 - Graded Rings, Modules and Poincaré Series

Lecture 23 - Hilbert-Samuel Polynomials

Lecture 24 - Hilbert-Samuel Polynomials (Continued...)

Lecture 25 - Numerical Function of polynomial type

Lecture 26 - Hilbert-Samuel Polynomial of a Local ring

Lecture 27 - Filtration on a Module

Lecture 28 - Artin-Rees Lemma

Lecture 29 - Dimension Theorem

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Dimension Theorem (Continued...)
- Lecture 31 - Consequences of Dimension Theorem
- Lecture 32 - Generalized Krull's Principal Ideal Theorem
- Lecture 33 - Second proof of Krull's Principal Ideal Theorem
- Lecture 34 - The Spec Functor
- Lecture 35 - Prime ideals in Polynomial rings
- Lecture 36 - Characterization of Equidimensional Affine Algebra
- Lecture 37 - Connection between Regular local rings and associated graded rings
- Lecture 38 - Statement of the Jacobian Criterion for Regularity
- Lecture 39 - Hilbert function for Affine Algebra
- Lecture 40 - Hilbert Serre Theorem
- Lecture 41 - Jacobian Matrix and its Rank
- Lecture 42 - Jacobian Matrix and its Rank (Continued...)
- Lecture 43 - Proof of Jacobian Criterion
- Lecture 44 - Proof of Jacobian Criterion (Continued...)
- Lecture 45 - Preparation for Homological Dimension
- Lecture 46 - Complexes of Modules and Homology
- Lecture 47 - Projective Modules
- Lecture 48 - Homological Dimension and Projective module
- Lecture 49 - Global Dimension
- Lecture 50 - Homological characterization of Regular Local Rings (RLR)
- Lecture 51 - Homological characterization of Regular Local Rings (Continued...)
- Lecture 52 - Homological Characterization of Regular Local Rings (Continued...)
- Lecture 53 - Regular Local Rings are UFD
- Lecture 54 - RLR-Prime ideals of height 1
- Lecture 55 - Discrete Valuation Ring
- Lecture 56 - Discrete Valuation Ring (Continued...)
- Lecture 57 - Dedekind Domains
- Lecture 58 - Fractionary Ideals and Dedekind Domains
- Lecture 59 - Characterization of Dedekind Domain
- Lecture 60 - Dedekind Domains and prime factorization of ideals

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

NPTEL Video Course - Mathematics - NOC:Galois Theory

Subject Co-ordinator - Prof. Dilip P. Patil

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Historical Perspectives

Lecture 2 - Examples of Fields

Lecture 3 - Polynomials and Basic properties

Lecture 4 - Polynomial Rings

Lecture 5 - Unit and Unit Groups

Lecture 6 - Division with remainder and prime factorization

Lecture 7 - Zeroes of Polynomials

Lecture 8 - Polynomial functions

Lecture 9 - Algebraically closed Fields and statement of FTA

Lecture 10 - Gauss's Theorem (Uniqueness of factorization)

Lecture 11 - Digression on Rings homomorphism, Algebras

Lecture 12 - Kernel of homomorphisms and ideals in $K[X], Z$

Lecture 13 - Algebraic elements

Lecture 14 - Examples

Lecture 15 - Minimal Polynomials

Lecture 16 - Characterization of Algebraic elements

Lecture 17 - Theorem of Kronecker

Lecture 18 - Examples

Lecture 19 - Digression on Groups

Lecture 20 - Some examples and Characteristic of a Ring

Lecture 21 - Finite subGroups of the Unit Group of a Field

Lecture 22 - Construction of Finite Fields

Lecture 23 - Digression on Group action - I

Lecture 24 - Automorphism Groups of a Field Extension

Lecture 25 - Dedekind-Artin Theorem

Lecture 26 - Galois Extension

Lecture 27 - Examples of Galois extension

Lecture 28 - Examples of Automorphism Groups

Lecture 29 - Digression on Linear Algebra

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Minimal and Characteristic Polynomials, Norms, Trace of elements
- Lecture 31 - Primitive Element Theorem for Galois Extension
- Lecture 32 - Fundamental Theorem of Galois Theory
- Lecture 33 - Fundamental Theorem of Galois Theory (Continued...)
- Lecture 34 - Cyclotomic extensions
- Lecture 35 - Cyclotomic Polynomials
- Lecture 36 - Irreducibility of Cyclotomic Polynomials over \mathbb{Q}
- Lecture 37 - Reducibility of Cyclotomic Polynomials over Finite Fields
- Lecture 38 - Galois Group of Cyclotomic Polynomials
- Lecture 39 - Extension over a fixed Field of a finite subGroup is Galois Extension
- Lecture 40 - Digression on Group action - II
- Lecture 41 - Correspondence of Normal SubGroups and Galois sub-extensions
- Lecture 42 - Correspondence of Normal SubGroups and Galois sub-extensions (Continued...)
- Lecture 43 - Inverse Galois problem for Abelian Groups
- Lecture 44 - Elementary Symmetric Polynomials
- Lecture 45 - Fundamental Theorem on Symmetric Polynomials
- Lecture 46 - $\text{Gal}(K[X_1, X_2, \dots, X_n]/K[S_1, S_2, \dots, S_n])$
- Lecture 47 - Digression on Symmetric and Alternating Group
- Lecture 48 - Discriminant of a Polynomial
- Lecture 49 - Zeroes and Embeddings
- Lecture 50 - Normal Extensions
- Lecture 51 - Existence of Algebraic Closure
- Lecture 52 - Uniqueness of Algebraic Closure
- Lecture 53 - Proof of The Fundamental Theorem of Algebra
- Lecture 54 - Galois Group of a Polynomial
- Lecture 55 - Perfect Fields
- Lecture 56 - Embeddings
- Lecture 57 - Characterization of finite Separable extension
- Lecture 58 - Primitive Element Theorem
- Lecture 59 - Equivalence of Galois extensions and Normal-Separable extensions
- Lecture 60 - Operation of Galois Group of Polynomial on the set of zeroes
- Lecture 61 - Discriminants
- Lecture 62 - Examples for further study

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

NPTEL Video Course - Mathematics - Stochastic Processes

Subject Co-ordinator - Dr. S. Dharmaraja

Co-ordinating Institute - IIT - Delhi

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

- Lecture 1 - Introduction to Stochastic Processes
- Lecture 2 - Introduction to Stochastic Processes (Continued.)
- Lecture 3 - Problems in Random Variables and Distributions
- Lecture 4 - Problems in Sequences of Random Variables
- Lecture 5 - Definition, Classification and Examples
- Lecture 6 - Simple Stochastic Processes
- Lecture 7 - Stationary Processes
- Lecture 8 - Autoregressive Processes
- Lecture 9 - Introduction, Definition and Transition Probability Matrix
- Lecture 10 - Chapman-Kolmogorov Equations
- Lecture 11 - Classification of States and Limiting Distributions
- Lecture 12 - Limiting and Stationary Distributions
- Lecture 13 - Limiting Distributions, Ergodicity and Stationary Distributions
- Lecture 14 - Time Reversible Markov Chain, Application of Irreducible Markov Chain in Queueing Models
- Lecture 15 - Reducible Markov Chains
- Lecture 16 - Definition, Kolmogorov Differential Equations and Infinitesimal Generator Matrix
- Lecture 17 - Limiting and Stationary Distributions, Birth Death Processes
- Lecture 18 - Poisson Processes
- Lecture 19 - M/M/1 Queueing Model
- Lecture 20 - Simple Markovian Queueing Models
- Lecture 21 - Queueing Networks
- Lecture 22 - Communication Systems
- Lecture 23 - Stochastic Petri Nets
- Lecture 24 - Conditional Expectation and Filtration
- Lecture 25 - Definition and Simple Examples
- Lecture 26 - Definition and Properties
- Lecture 27 - Processes Derived from Brownian Motion
- Lecture 28 - Stochastic Differential Equations
- Lecture 29 - Ito Integrals

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Ito Formula and its Variants
- Lecture 31 - Some Important SDE`s and Their Solutions
- Lecture 32 - Renewal Function and Renewal Equation
- Lecture 33 - Generalized Renewal Processes and Renewal Limit Theorems
- Lecture 34 - Markov Renewal and Markov Regenerative Processes
- Lecture 35 - Non Markovian Queues
- Lecture 36 - Non Markovian Queues Cont,,
- Lecture 37 - Application of Markov Regenerative Processes
- Lecture 38 - Galton-Watson Process
- Lecture 39 - Markovian Branching Process

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

NPTEL Video Course - Mathematics - NOC:Stochastic Processes - 1

Subject Co-ordinator - Dr. S. Dharmaraja

Co-ordinating Institute - IIT - Delhi

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

- Lecture 1 - Introduction and motivation for studying stochastic processes
- Lecture 2 - Probability space and conditional probability
- Lecture 3 - Random variable and cumulative distributive function
- Lecture 4 - Discrete Uniform Distribution, Binomial Distribution, Geometric Distribution, Continuous Uniform
- Lecture 5 - Joint Distribution of Random Variables
- Lecture 6 - Independent Random Variables, Covariance and Correlation Coefficient and Conditional Distribution
- Lecture 7 - Conditional Expectation and Covariance Matrix
- Lecture 8 - Generating Functions, Law of Large Numbers and Central Limit Theorem
- Lecture 9 - Problems in Random variables and Distributions
- Lecture 10 - Problems in Random variables and Distributions (Continued...)
- Lecture 11 - Problems in Random variables and Distributions (Continued...)
- Lecture 12 - Problems in Random variables and Distributions (Continued...)
- Lecture 13 - Problems in Sequences of Random Variables
- Lecture 14 - Problems in Sequences of Random Variables (Continued...)
- Lecture 15 - Problems in Sequences of Random Variables (Continued...)
- Lecture 16 - Problems in Sequences of Random Variables (Continued...)
- Lecture 17 - Definition of Stochastic Processes, Parameter and State Spaces
- Lecture 18 - Classification of Stochastic Processes
- Lecture 19 - Examples of Classification of Stochastic Processes
- Lecture 20 - Examples of Classification of Stochastic Processes (Continued...)
- Lecture 21 - Bernoulli Process
- Lecture 22 - Poisson Process
- Lecture 23 - Poisson Process (Continued...)
- Lecture 24 - Simple Random Walk and Population Processes
- Lecture 25 - Introduction to Discrete time Markov Chain
- Lecture 26 - Introduction to Discrete time Markov Chain (Continued...)
- Lecture 27 - Examples of Discrete time Markov Chain
- Lecture 28 - Examples of Discrete time Markov Chain (Continued...)
- Lecture 29 - Introduction to Chapman-Kolmogorov equations

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - State Transition Diagram and Examples
- Lecture 31 - Examples
- Lecture 32 - Introduction to Classification of States and Periodicity
- Lecture 33 - Closed set of States and Irreducible Markov Chain
- Lecture 34 - First Passage time and Mean Recurrence Time
- Lecture 35 - Recurrent State and Transient State
- Lecture 36 - Introduction and example of Classification of states
- Lecture 37 - Example of Classification of states (Continued...)
- Lecture 38 - Example of Classification of states (Continued...)
- Lecture 39 - Example of Classification of states (Continued...)
- Lecture 40 - Introduction and Limiting Distribution
- Lecture 41 - Example of Limiting Distribution and Ergodicity
- Lecture 42 - Stationary Distribution and Examples
- Lecture 43 - Examples of Stationary Distributions
- Lecture 44 - Time Reversible Markov Chain and Examples
- Lecture 45 - Definition of Reducible Markov Chains and Types of Reducible Markov Chains
- Lecture 46 - Stationary Distributions and Types of Reducible Markov chains
- Lecture 47 - Type of Reducible Markov Chains (Continued...)
- Lecture 48 - Gambler's Ruin Problem
- Lecture 49 - Introduction to Continuous time Markov Chain
- Lecture 50 - Waiting time Distribution
- Lecture 51 - Chapman-Kolmogorov Equation
- Lecture 52 - Infinitesimal Generator Matrix
- Lecture 53 - Introduction and Example Of Continuous time Markov Chain
- Lecture 54 - Limiting and Stationary Distributions
- Lecture 55 - Time reversible CTMC and Birth Death Process
- Lecture 56 - Steady State Distributions, Pure Birth Process and Pure Death Process
- Lecture 57 - Introduction to Poisson Process
- Lecture 58 - Definition of Poisson Process
- Lecture 59 - Superposition and Deposition of Poisson Process
- Lecture 60 - Compound Poisson Process and Examples
- Lecture 61 - Introduction to Queueing Systems and Kendall Notations
- Lecture 62 - M/M/1 Queueing Model
- Lecture 63 - Little's Law, Distribution of Waiting Time and Response Time
- Lecture 64 - Burke's Theorem and Simulation of M/M/1 queueing Model
- Lecture 65 - M/M/c Queueing Model
- Lecture 66 - M/M/1/N Queueing Model
- Lecture 67 - M/M/c/K Model, M/M/c/c Loss System, M/M/? Self Service System
- Lecture 68 - Transient Solution of Finite Birth Death Process and Finite Source Markovian Queueing Model

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 69 - Queueing Networks Characteristics and Types of Queueing Networks
- Lecture 70 - Tandem Queueing Networks
- Lecture 71 - Stationary Distribution and Open Queueing Network
- Lecture 72 - Jackson's Theorem, Closed Queueing Networks, Gordon and Newell Results
- Lecture 73 - Wireless Handoff Performance Model and System Description
- Lecture 74 - Description of 3G Cellular Networks and Queueing Model
- Lecture 75 - Simulation of Queueing Systems
- Lecture 76 - Definition and Basic Components of Petri Net and Reachability Analysis
- Lecture 77 - Arc Extensions in Petri Net, Stochastic Petri Nets and examples

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

NPTEL Video Course - Mathematics - NOC:Stochastic Processes

Subject Co-ordinator - Dr. S. Dharmaraja

Co-ordinating Institute - IIT - Delhi

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

- Lecture 1 - Introduction and motivation for studying stochastic processes
- Lecture 2 - Probability space and conditional probability
- Lecture 3 - Random variable and cumulative distributive function
- Lecture 4 - Discrete Uniform Distribution, Binomial Distribution, Geometric Distribution, Continuous Uniform
- Lecture 5 - Joint Distribution of Random Variables
- Lecture 6 - Independent Random Variables, Covariance and Correlation Coefficient and Conditional Distribution
- Lecture 7 - Conditional Expectation and Covariance Matrix
- Lecture 8 - Generating Functions, Law of Large Numbers and Central Limit Theorem
- Lecture 9 - Problems in Random variables and Distributions
- Lecture 10 - Problems in Random variables and Distributions (Continued...)
- Lecture 11 - Problems in Random variables and Distributions (Continued...)
- Lecture 12 - Problems in Random variables and Distributions (Continued...)
- Lecture 13 - Problems in Sequences of Random Variables
- Lecture 14 - Problems in Sequences of Random Variables (Continued...)
- Lecture 15 - Problems in Sequences of Random Variables (Continued...)
- Lecture 16 - Problems in Sequences of Random Variables (Continued...)
- Lecture 17 - Definition of Stochastic Processes, Parameter and State Spaces
- Lecture 18 - Classification of Stochastic Processes
- Lecture 19 - Examples of Classification of Stochastic Processes
- Lecture 20 - Examples of Classification of Stochastic Processes (Continued...)
- Lecture 21 - Bernoulli Process
- Lecture 22 - Poisson Process
- Lecture 23 - Poisson Process (Continued...)
- Lecture 24 - Simple Random Walk and Population Processes
- Lecture 25 - Introduction to Discrete time Markov Chain
- Lecture 26 - Introduction to Discrete time Markov Chain (Continued...)
- Lecture 27 - Examples of Discrete time Markov Chain
- Lecture 28 - Examples of Discrete time Markov Chain (Continued...)
- Lecture 29 - Introduction to Chapman-Kolmogorov equations

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - State Transition Diagram and Examples
- Lecture 31 - Examples
- Lecture 32 - Introduction to Classification of States and Periodicity
- Lecture 33 - Closed set of States and Irreducible Markov Chain
- Lecture 34 - First Passage time and Mean Recurrence Time
- Lecture 35 - Recurrent State and Transient State
- Lecture 36 - Introduction and example of Classification of states
- Lecture 37 - Example of Classification of states (Continued...)
- Lecture 38 - Example of Classification of states (Continued...)
- Lecture 39 - Example of Classification of states (Continued...)
- Lecture 40 - Introduction and Limiting Distribution
- Lecture 41 - Example of Limiting Distribution and Ergodicity
- Lecture 42 - Stationary Distribution and Examples
- Lecture 43 - Examples of Stationary Distributions
- Lecture 44 - Time Reversible Markov Chain and Examples
- Lecture 45 - Definition of Reducible Markov Chains and Types of Reducible Markov Chains
- Lecture 46 - Stationary Distributions and Types of Reducible Markov chains
- Lecture 47 - Type of Reducible Markov Chains (Continued...)
- Lecture 48 - Gambler's Ruin Problem
- Lecture 49 - Introduction to Continuous time Markov Chain
- Lecture 50 - Waiting time Distribution
- Lecture 51 - Chapman-Kolmogorov Equation
- Lecture 52 - Infinitesimal Generator Matrix
- Lecture 53 - Introduction and Example Of Continuous time Markov Chain
- Lecture 54 - Limiting and Stationary Distributions
- Lecture 55 - Time reversible CTMC and Birth Death Process
- Lecture 56 - Steady State Distributions, Pure Birth Process and Pure Death Process
- Lecture 57 - Introduction to Poisson Process
- Lecture 58 - Definition of Poisson Process
- Lecture 59 - Superposition and Deposition of Poisson Process
- Lecture 60 - Compound Poisson Process and Examples
- Lecture 61 - Introduction to Queueing Systems and Kendall Notations
- Lecture 62 - M/M/1 Queueing Model
- Lecture 63 - Little's Law, Distribution of Waiting Time and Response Time
- Lecture 64 - Burke's Theorem and Simulation of M/M/1 queueing Model
- Lecture 65 - M/M/c Queueing Model
- Lecture 66 - M/M/1/N Queueing Model
- Lecture 67 - M/M/c/K Model, M/M/c/c Loss System, M/M/? Self Service System
- Lecture 68 - Transient Solution of Finite Birth Death Process and Finite Source Markovian Queueing Model

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 69 - Queueing Networks Characteristics and Types of Queueing Networks
- Lecture 70 - Tandem Queueing Networks
- Lecture 71 - Stationary Distribution and Open Queueing Network
- Lecture 72 - Jackson's Theorem, Closed Queueing Networks, Gordon and Newell Results
- Lecture 73 - Wireless Handoff Performance Model and System Description
- Lecture 74 - Description of 3G Cellular Networks and Queueing Model
- Lecture 75 - Simulation of Queueing Systems
- Lecture 76 - Definition and Basic Components of Petri Net and Reachability Analysis
- Lecture 77 - Arc Extensions in Petri Net, Stochastic Petri Nets and examples
- Lecture 78 - Generalized Stochastic Petri Net
- Lecture 79 - Generalized Stochastic Petri Net (Continued...)
- Lecture 80 - Conditional Expectation and Examples
- Lecture 81 - Filtration in Discrete time
- Lecture 82 - Remarks of Conditional Expectation and Adaptability
- Lecture 83 - Definition and Examples of Martingale
- Lecture 84 - Examples of Martingale (Continued...)
- Lecture 85 - Examples of Martingale (Continued...)
- Lecture 86 - Doob's Martingale Process, Sub martingale and Super Martingale
- Lecture 87 - Definition of Brownian Motion
- Lecture 88 - Definition of Brownian Motion (Continued...)
- Lecture 89 - Properties of Brownian Motion
- Lecture 90 - Processes Derived from Brownian Motion
- Lecture 91 - Processes Derived from Brownian Motion (Continued...)
- Lecture 92 - Processes Derived from Brownian Motion (Continued...)
- Lecture 93 - Stochastic Differential Equations
- Lecture 94 - Stochastic Differential Equations (Continued...)
- Lecture 95 - Stochastic Differential Equations (Continued...)
- Lecture 96 - Ito Integrals
- Lecture 97 - Ito Integrals (Continued...)
- Lecture 98 - Ito Integrals (Continued...)
- Lecture 99 - Renewal Function and Renewal Equation
- Lecture 100 - Renewal Function and Renewal Equation (Continued...)
- Lecture 101 - Renewal Function and Renewal Equation (Continued...)
- Lecture 102 - Generalized Renewal Processes and Renewal Limit Theorems
- Lecture 103 - Generalized Renewal Processes and Renewal Limit Theorems (Continued...)
- Lecture 104 - Generalized Renewal Processes and Renewal Limit Theorems (Continued...)
- Lecture 105 - Markov Renewal and Markov Regenerative Processes
- Lecture 106 - Markov Renewal and Markov Regenerative Processes (Continued...)
- Lecture 107 - Markov Renewal and Markov Regenerative Processes (Continued...)

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 108 - Markov Renewal and Markov Regenerative Processes (Continued...)
- Lecture 109 - Non Markovian Queues
- Lecture 110 - Non Markovian Queues (Continued...)
- Lecture 111 - Non Markovian Queues (Continued...)
- Lecture 112 - Stationary Processes
- Lecture 113 - Stationary Processes (Continued...)
- Lecture 114 - Stationary Processes (Continued...)
- Lecture 115 - Stationary Processes (Continued...) and Ergodicity
- Lecture 116 - G1/M/1 queue
- Lecture 117 - G1/M/1 queue (Continued...)
- Lecture 118 - G1/M/1/N queue and examples
- Lecture 119 - Galton-Watson Process
- Lecture 120 - Examples and Theorems
- Lecture 121 - Theorems and Examples (Continued...)
- Lecture 122 - Markov Branching Process
- Lecture 123 - Markov Branching Process Theorems and Properties
- Lecture 124 - Markov Branching Process Theorems and Properties (Continued...)

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

NPTEL Video Course - Mathematics - NOC:Chaotic Dynamical Systems

Subject Co-ordinator - Dr. Anima Nagar

Co-ordinating Institute - IIT - Delhi

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

- Lecture 1 - The beginning
- Lecture 2 - Elementary Concepts
- Lecture 3 - Elementary Concepts (Continued...)
- Lecture 4 - More on orbits
- Lecture 5 - Periods of Periodic Points
- Lecture 6 - Scrambled Sets
- Lecture 7 - Sensitive Dependence on Initial Conditions
- Lecture 8 - A Population Dynamics Model
- Lecture 9 - Bifurcations
- Lecture 10 - Nonlinear Systems
- Lecture 11 - Horseshoe Attractor
- Lecture 12 - Dynamics of the Horseshoe Attractor
- Lecture 13 - Recurrence
- Lecture 14 - Recurrence (Continued...)
- Lecture 15 - Transitivity
- Lecture 16 - Devaney's Chaos
- Lecture 17 - Transitivity = Chaos on Intervals
- Lecture 18 - Stronger forms of Transitivity
- Lecture 19 - Chaotic Properties of Mixing Systems
- Lecture 20 - Weakly Mixing and Chaos
- Lecture 21 - Strongly Transitive Systems
- Lecture 22 - Strongly Transitive Systems (Continued...)
- Lecture 23 - Introduction to Symbolic Dynamics
- Lecture 24 - Shift Spaces
- Lecture 25 - Subshifts of Finite Type
- Lecture 26 - Subshifts of Finite Type (Continued...), Chaotic Dynamical Systems
- Lecture 27 - Measuring Chaos - Topological Entropy
- Lecture 28 - Topological Entropy - Adler's Version
- Lecture 29 - Bowen's Definition of Topological Entropy

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Equivalence of the two definitions of Topological Entropy
- Lecture 31 - Linear Systems in Two Dimensions
- Lecture 32 - Asymptotic Properties of Orbits of Linear Transformation in \mathbb{R}^2
- Lecture 33 - Hyperbolic Toral Automorphisms
- Lecture 34 - Chaos in Toral Automorphisms
- Lecture 35 - Chaotic Attractors of Henon Maps

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

NPTEL Video Course - Mathematics - NOC:Introduction to Probability Theory and Stochastic Processes

Subject Co-ordinator - Dr. S. Dharmaraja

Co-ordinating Institute - IIT - Delhi

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

- Lecture 1 - Random experiment, sample space, axioms of probability, probability space
- Lecture 2 - Random experiment, sample space, axioms of probability, probability space (Continued...)
- Lecture 3 - Random experiment, sample space, axioms of probability, probability space (Continued...)
- Lecture 4 - Conditional probability, independence of events.
- Lecture 5 - Multiplication rule, total probability rule, Bayes's theorem.
- Lecture 6 - Definition of Random Variable, Cumulative Distribution Function
- Lecture 7 - Definition of Random Variable, Cumulative Distribution Function (Continued...)
- Lecture 8 - Definition of Random Variable, Cumulative Distribution Function (Continued...)
- Lecture 9 - Type of Random Variables, Probability Mass Function, Probability Density Function
- Lecture 10 - Type of Random Variables, Probability Mass Function, Probability Density Function (Continued...)
- Lecture 11 - Distribution of Function of Random Variables
- Lecture 12 - Mean and Variance
- Lecture 13 - Mean and Variance (Continued...)
- Lecture 14 - Higher Order Moments and Moments Inequalities
- Lecture 15 - Higher Order Moments and Moments Inequalities (Continued...)
- Lecture 16 - Generating Functions
- Lecture 17 - Generating Functions (Continued...)
- Lecture 18 - Common Discrete Distributions
- Lecture 19 - Common Discrete Distributions (Continued...)
- Lecture 20 - Common Continuous Distributions
- Lecture 21 - Common Continuous Distributions (Continued...)
- Lecture 22 - Applications of Random Variable
- Lecture 23 - Applications of Random Variable (Continued...)
- Lecture 24 - Random vector and joint distribution
- Lecture 25 - Joint probability mass function
- Lecture 26 - Joint probability density function
- Lecture 27 - Independent random variables
- Lecture 28 - Independent random variables (Continued...)
- Lecture 29 - Functions of several random variables

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Functions of several random variables (Continued...)
- Lecture 31 - Some important results
- Lecture 32 - Order statistics
- Lecture 33 - Conditional distributions
- Lecture 34 - Random sum
- Lecture 35 - Moments and Covariance
- Lecture 36 - Variance Covariance matrix
- Lecture 37 - Multivariate Normal distribution
- Lecture 38 - Probability generating function and Moment generating function
- Lecture 39 - Correlation coefficient
- Lecture 40 - Conditional Expectation
- Lecture 41 - Conditional Expectation (Continued...)
- Lecture 42 - Modes of Convergence
- Lecture 43 - Mode of Convergence (Continued...)
- Lecture 44 - Law of Large Numbers
- Lecture 45 - Central Limit Theorem
- Lecture 46 - Central Limit Theorem (Continued...)
- Lecture 47 - Motivation for Stochastic Processes
- Lecture 48 - Definition of a Stochastic Process
- Lecture 49 - Classification of Stochastic Processes
- Lecture 50 - Examples of Stochastic Process
- Lecture 51 - Examples Of Stochastic Process (Continued...)
- Lecture 52 - Bernoulli Process
- Lecture 53 - Poisson Process
- Lecture 54 - Poisson Process (Continued...)
- Lecture 55 - Simple Random Walk
- Lecture 56 - Time Series and Related Definitions
- Lecture 57 - Strict Sense Stationary Process
- Lecture 58 - Wide Sense Stationary Process and Examples
- Lecture 59 - Examples of Stationary Processes (Continued...)
- Lecture 60 - Discrete Time Markov Chain (DTMC)
- Lecture 61 - DTMC (Continued...)
- Lecture 62 - Examples of DTMC
- Lecture 63 - Examples of DTMC (Continued...)
- Lecture 64 - Chapman-Kolmogorov equations and N-step transition matrix
- Lecture 65 - Examples based on N-step transition matrix
- Lecture 66 - Examples (Continued...)
- Lecture 67 - Classification of states
- Lecture 68 - Classification of states (Continued...)

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 69 - Calculation of N-Step - 9
- Lecture 70 - Calculation of N-Step - 10
- Lecture 71 - Limiting and Stationary distributions
- Lecture 72 - Limiting and Stationary distributions (Continued...)
- Lecture 73 - Continuous time Markov chain (CTMC)
- Lecture 74 - CTMC (Continued...)
- Lecture 75 - State transition diagram and Chapman-Kolmogorov equation
- Lecture 76 - Infinitesimal generator and Kolmogorov differential equations
- Lecture 77 - Limiting distribution
- Lecture 78 - Limiting and Stationary distributions - 1
- Lecture 79 - Birth death process
- Lecture 80 - Birth death process (Continued...)
- Lecture 81 - Poisson process - 1
- Lecture 82 - Poisson process (Continued...)
- Lecture 83 - Poisson process (Continued...)
- Lecture 84 - Non-homogeneous and compound Poisson process
- Lecture 85 - Introduction to Queueing Models and Kendall Notation
- Lecture 86 - M/M/1 Queueing Model
- Lecture 87 - M/M/1 Queueing Model (Continued...)
- Lecture 88 - M/M/1 Queueing Model and Burke's Theorem
- Lecture 89 - M/M/c Queueing Model
- Lecture 90 - M/M/c (Continued...) and M/M/1/N Model
- Lecture 91 - Other Markovian Queueing Models
- Lecture 92 - Transient Solution of Finite Capacity Markovian Queues

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

NPTEL Video Course - Mathematics - NOC:Statistical Inference

Subject Co-ordinator - Prof. Nilladri Chatterjee

Co-ordinating Institute - IIT - Delhi

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

Lecture 1 - Statistical Inference - 1
Lecture 2 - Statistical Inference - 2
Lecture 3 - Statistical Inference - 3
Lecture 4 - Statistical Inference - 4
Lecture 5 - Statistical Inference - 5
Lecture 6 - Statistical Inference - 6
Lecture 7 - Statistical Inference - 7
Lecture 8 - Statistical Inference - 8
Lecture 9 - Statistical Inference - 9
Lecture 10 - Statistical Inference - 10
Lecture 11 - Statistical Inference - 11
Lecture 12 - Statistical Inference - 12
Lecture 13 - Statistical Inference - 13
Lecture 14 - Statistical Inference - 14
Lecture 15 - Statistical Inference - 15
Lecture 16 - Stasistical Inference - 16
Lecture 17 - Stasistical Inference - 17
Lecture 18 - Statistical Inference - 18
Lecture 19 - Stasistical Inference - 19
Lecture 20 - Stasistical Inference - 20
Lecture 21 - Stasistical Inference - 21

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

NPTEL Video Course - Mathematics - Formal Languages and Automata Theory

Subject Co-ordinator - Dr. K.V. Krishna, Dr. Diganta Goswami

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Introduction
Lecture 2 - Alphabet, Strings, Languages
Lecture 3 - Finite Representation
Lecture 4 - Grammars (CFG)
Lecture 5 - Derivation Trees
Lecture 6 - Regular Grammars
Lecture 7 - Finite Automata
Lecture 8 - Nondeterministic Finite Automata
Lecture 9 - NFA \Leftrightarrow DFA
Lecture 10 - Myhill-Nerode Theorem
Lecture 11 - Minimization
Lecture 12 - RE \Rightarrow FA
Lecture 13 - FA \Rightarrow RE
Lecture 14 - FA \Leftrightarrow RG
Lecture 15 - Variants of FA
Lecture 16 - Closure Properties of RL
Lecture 17 - Homomorphism
Lecture 18 - Pumping Lemma
Lecture 19 - Simplification of CFG
Lecture 20 - Normal Forms of CFG
Lecture 21 - Properties of CFLs
Lecture 22 - Pushdown Automata
Lecture 23 - PDA \Leftrightarrow CFG
Lecture 24 - Turing Machines
Lecture 25 - Turing Computable Functions
Lecture 26 - Combining Turing Machines
Lecture 27 - Multi Input
Lecture 28 - Turing Decidable Languages
Lecture 29 - Variants of Turing Machines

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Structured Grammars
- Lecture 31 - Decidability
- Lecture 32 - Undecidability 1
- Lecture 33 - Undecidability 2
- Lecture 34 - Undecidability 3
- Lecture 35 - Time Bounded Turing Machines
- Lecture 36 - P and NP
- Lecture 37 - NP-Completeness
- Lecture 38 - NP-Complete Problems 1
- Lecture 39 - NP-Complete Problems 2
- Lecture 40 - NP-Complete Problems 3
- Lecture 41 - Chomsky Hierarchy

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

NPTEL Video Course - Mathematics - Complex Analysis

Subject Co-ordinator - Prof. P.A.S. Sree Krishna

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Introduction
- Lecture 2 - Introduction to Complex Numbers
- Lecture 3 - de Moivre's Formula and Stereographic Projection
- Lecture 4 - Topology of the Complex Plane - Part-I
- Lecture 5 - Topology of the Complex Plane - Part-II
- Lecture 6 - Topology of the Complex Plane - Part-III
- Lecture 7 - Introduction to Complex Functions
- Lecture 8 - Limits and Continuity
- Lecture 9 - Differentiation
- Lecture 10 - Cauchy-Riemann Equations and Differentiability
- Lecture 11 - Analytic functions; the exponential function
- Lecture 12 - Sine, Cosine and Harmonic functions
- Lecture 13 - Branches of Multifunctions; Hyperbolic Functions
- Lecture 14 - Problem Solving Session I
- Lecture 15 - Integration and Contours
- Lecture 16 - Contour Integration
- Lecture 17 - Introduction to Cauchy's Theorem
- Lecture 18 - Cauchy's Theorem for a Rectangle
- Lecture 19 - Cauchy's theorem - Part-II
- Lecture 20 - Cauchy's Theorem - Part-III
- Lecture 21 - Cauchy's Integral Formula and its Consequences
- Lecture 22 - The First and Second Derivatives of Analytic Functions
- Lecture 23 - Morera's Theorem and Higher Order Derivatives of Analytic Functions
- Lecture 24 - Problem Solving Session II
- Lecture 25 - Introduction to Complex Power Series
- Lecture 26 - Analyticity of Power Series
- Lecture 27 - Taylor's Theorem
- Lecture 28 - Zeroes of Analytic Functions
- Lecture 29 - Counting the Zeroes of Analytic Functions

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Open mapping theorem - Part-I
- Lecture 31 - Open mapping theorem - Part-II
- Lecture 32 - Properties of Mobius Transformations - Part-I
- Lecture 33 - Properties of Mobius Transformations - Part-II
- Lecture 34 - Problem Solving Session III
- Lecture 35 - Removable Singularities
- Lecture 36 - Poles Classification of Isolated Singularities
- Lecture 37 - Essential Singularity & Introduction to Laurent Series
- Lecture 38 - Laurent's Theorem
- Lecture 39 - Residue Theorem and Applications
- Lecture 40 - Problem Solving Session IV

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

NPTEL Video Course - Mathematics - Applied Multivariate Analysis

Subject Co-ordinator - Dr. Sharmishtha Mitra

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Prologue
- Lecture 2 - Basic concepts on multivariate distribution
- Lecture 3 - Basic concepts on multivariate distribution
- Lecture 4 - Multivariate normal distribution - I
- Lecture 5 - Multivariate normal distribution - II
- Lecture 6 - Multivariate normal distribution - III
- Lecture 7 - Some problems on multivariate distributions - I
- Lecture 8 - Some problems on multivariate distributions - II
- Lecture 9 - Random sampling from multivariate normal distribution and Wishart distribution - I
- Lecture 10 - Random sampling from multivariate normal distribution and Wishart distribution - II
- Lecture 11 - Random sampling from multivariate normal distribution and Wishart distribution - III
- Lecture 12 - Wishart distribution and its properties - I
- Lecture 13 - Wishart distribution and its properties - II
- Lecture 14 - Hotelling's T^2 distribution and its applications
- Lecture 15 - Hotelling's T^2 distribution and various confidence intervals and regions
- Lecture 16 - Hotelling's T^2 distribution and Profile analysis
- Lecture 17 - Profile analysis - I
- Lecture 18 - Profile analysis - II
- Lecture 19 - MANOVA - I
- Lecture 20 - MANOVA - II
- Lecture 21 - MANOVA - III
- Lecture 22 - MANOVA & Multiple Correlation Coefficient
- Lecture 23 - Multiple Correlation Coefficient
- Lecture 24 - Principal Component Analysis
- Lecture 25 - Principal Component Analysis
- Lecture 26 - Principal Component Analysis
- Lecture 27 - Cluster Analysis
- Lecture 28 - Cluster Analysis
- Lecture 29 - Cluster Analysis

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Cluster Analysis
- Lecture 31 - Discriminant Analysis and Classification
- Lecture 32 - Discriminant Analysis and Classification
- Lecture 33 - Discriminant Analysis and Classification
- Lecture 34 - Discriminant Analysis and Classification
- Lecture 35 - Discriminant Analysis and Classification
- Lecture 36 - Discriminant Analysis and Classification
- Lecture 37 - Discriminant Analysis and Classification
- Lecture 38 - Factor_Analysis
- Lecture 39 - Factor_Analysis
- Lecture 40 - Factor_Analysis
- Lecture 41 - Canonical Correlation Analysis
- Lecture 42 - Canonical Correlation Analysis
- Lecture 43 - Canonical Correlation Analysis
- Lecture 44 - Canonical Correlation Analysis

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

NPTEL Video Course - Mathematics - Calculus of Variations and Integral Equations

Subject Co-ordinator - Dr. Malay Banerjee, Prof. D. Bahuguna

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Calculus of Variations and Integral Equations
Lecture 2 - Calculus of Variations and Integral Equations
Lecture 3 - Calculus of Variations and Integral Equations
Lecture 4 - Calculus of Variations and Integral Equations
Lecture 5 - Calculus of Variations and Integral Equations
Lecture 6 - Calculus of Variations and Integral Equations
Lecture 7 - Calculus of Variations and Integral Equations
Lecture 8 - Calculus of Variations and Integral Equations
Lecture 9 - Calculus of Variations and Integral Equations
Lecture 10 - Calculus of Variations and Integral Equations
Lecture 11 - Calculus of Variations and Integral Equations
Lecture 12 - Calculus of Variations and Integral Equations
Lecture 13 - Calculus of Variations and Integral Equations
Lecture 14 - Calculus of Variations and Integral Equations
Lecture 15 - Calculus of Variations and Integral Equations
Lecture 16 - Calculus of Variations and Integral Equations
Lecture 17 - Calculus of Variations and Integral Equations
Lecture 18 - Calculus of Variations and Integral Equations
Lecture 19 - Calculus of Variations and Integral Equations
Lecture 20 - Calculus of Variations and Integral Equations
Lecture 21 - Calculus of Variations and Integral Equations
Lecture 22 - Calculus of Variations and Integral Equations
Lecture 23 - Calculus of Variations and Integral Equations
Lecture 24 - Calculus of Variations and Integral Equations
Lecture 25 - Calculus of Variations and Integral Equations
Lecture 26 - Calculus of Variations and Integral Equations
Lecture 27 - Calculus of Variations and Integral Equations
Lecture 28 - Calculus of Variations and Integral Equations
Lecture 29 - Calculus of Variations and Integral Equations

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

Lecture 30 - Calculus of Variations and Integral Equations
Lecture 31 - Calculus of Variations and Integral Equations
Lecture 32 - Calculus of Variations and Integral Equations
Lecture 33 - Calculus of Variations and Integral Equations
Lecture 34 - Calculus of Variations and Integral Equations
Lecture 35 - Calculus of Variations and Integral Equations
Lecture 36 - Calculus of Variations and Integral Equations
Lecture 37 - Calculus of Variations and Integral Equations
Lecture 38 - Calculus of Variations and Integral Equations
Lecture 39 - Calculus of Variations and Integral Equations
Lecture 40 - Calculus of Variations and Integral Equations

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

NPTEL Video Course - Mathematics - Linear programming and Extensions

Subject Co-ordinator - Prof. Prabha Sharma

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Introduction to Linear Programming Problems

Lecture 2 - Vector space, Linear independence and dependence, basis

Lecture 3 - Moving from one basic feasible solution to another, optimality criteria

Lecture 4 - Basic feasible solutions, existence & derivation

Lecture 5 - Convex sets, dimension of a polyhedron, Faces, Example of a polytope

Lecture 6 - Direction of a polyhedron, correspondence between bfs and extreme points

Lecture 7 - Representation theorem, LPP solution is a bfs, Assignment 1

Lecture 8 - Development of the Simplex Algorithm, Unboundedness, Simplex Tableau

Lecture 9 - Simplex Tableau & algorithm, Cycling, Bland's anti-cycling rules, Phase I & Phase II

Lecture 10 - Big-M method, Graphical solutions, adjacent extreme pts and adjacent bfs

Lecture 11 - Assignment 2, progress of Simplex algorithm on a polytope, bounded variable LPP

Lecture 12 - LPP Bounded variable, Revised Simplex algorithm, Duality theory, weak duality theorem

Lecture 13 - Weak duality theorem, economic interpretation of dual variables, Fundamental theorem of duality

Lecture 14 - Examples of writing the dual, complementary slackness theorem

Lecture 15 - Complementary slackness conditions, Dual Simplex algorithm, Assignment 3

Lecture 16 - Primal-dual algorithm

Lecture 17 - Problem in lecture 16, starting dual feasible solution, Shortest Path Problem

Lecture 18 - Shortest Path Problem, Primal-dual method, example

Lecture 19 - Shortest Path Problem-complexity, interpretation of dual variables, post-optimality analysis-changes in $\{a_{ij}\}$

Lecture 20 - Assignment 4, postoptimality analysis, changes in b , adding a new constraint, changes in $\{a_{ij}\}$

Lecture 21 - Parametric LPP-Right hand side vector

Lecture 22 - Parametric cost vector LPP

Lecture 23 - Parametric cost vector LPP, Introduction to Min-cost flow problem

Lecture 24 - Mini-cost flow problem-Transportation problem

Lecture 25 - Transportation problem degeneracy, cycling

Lecture 26 - Sensitivity analysis

Lecture 27 - Sensitivity analysis

Lecture 28 - Bounded variable transportation problem, min-cost flow problem

Lecture 29 - Min-cost flow problem

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Starting feasible solution, Lexicographic method for preventing cycling ,strongly feasible solution
- Lecture 31 - Assignment 6, Shortest path problem, Shortest Path between any two nodes, Detection of negative cycle
- Lecture 32 - Min-cost-flow Sensitivity analysis Shortest path problem sensitivity analysis
- Lecture 33 - Min-cost flow changes in arc capacities , Max-flow problem, assignment 7
- Lecture 34 - Problem 3 (assignment 7), Min-cut Max-flow theorem, Labelling algorithm
- Lecture 35 - Max-flow - Critical capacity of an arc, starting solution for min-cost flow problem
- Lecture 36 - Improved Max-flow algorithm
- Lecture 37 - Critical Path Method (CPM)
- Lecture 38 - Programme Evaluation and Review Technique (PERT)
- Lecture 39 - Simplex Algorithm is not polynomial time- An example
- Lecture 40 - Interior Point Methods

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

NPTEL Video Course - Mathematics - Convex Optimization

Subject Co-ordinator - Dr. Joydeep Dutta

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Convex Optimization
Lecture 2 - Convex Optimization
Lecture 3 - Convex Optimization
Lecture 4 - Convex Optimization
Lecture 5 - Convex Optimization
Lecture 6 - Convex Optimization
Lecture 7 - Convex Optimization
Lecture 8 - Convex Optimization
Lecture 9 - Convex Optimization
Lecture 10 - Convex Optimization
Lecture 11 - Convex Optimization
Lecture 12 - Convex Optimization
Lecture 13 - Convex Optimization
Lecture 14 - Convex Optimization
Lecture 15 - Convex Optimization
Lecture 16 - Convex Optimization
Lecture 17 - Convex Optimization
Lecture 18 - Convex Optimization
Lecture 19 - Convex Optimization
Lecture 20 - Convex Optimization
Lecture 21 - Convex Optimization
Lecture 22 - Convex Optimization
Lecture 23 - Convex Optimization
Lecture 24 - Convex Optimization
Lecture 25 - Convex Optimization
Lecture 26 - Convex Optimization
Lecture 27 - Convex Optimization
Lecture 28 - Convex Optimization
Lecture 29 - Convex Optimization

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

Lecture 30 - Convex Optimization
Lecture 31 - Convex Optimization
Lecture 32 - Convex Optimization
Lecture 33 - Convex Optimization
Lecture 34 - Convex Optimization
Lecture 35 - Convex Optimization
Lecture 36 - Convex Optimization
Lecture 37 - Convex Optimization
Lecture 38 - Convex Optimization
Lecture 39 - Convex Optimization
Lecture 40 - Convex Optimization
Lecture 41 - Convex Optimization
Lecture 42 - Convex Optimization

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

NPTEL Video Course - Mathematics - Foundations of Optimization

Subject Co-ordinator - Dr. Joydeep Dutta

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Optimization
Lecture 2 - Optimization
Lecture 3 - Optimization
Lecture 4 - Optimization
Lecture 5 - Optimization
Lecture 6 - Optimization
Lecture 7 - Optimization
Lecture 8 - Optimization
Lecture 9 - Optimization
Lecture 10 - Optimization
Lecture 11 - Optimization
Lecture 12 - Optimization
Lecture 13 - Optimization
Lecture 14 - Optimization
Lecture 15 - Optimization
Lecture 16 - Optimization
Lecture 17 - Optimization
Lecture 18 - Optimization
Lecture 19 - Optimization
Lecture 20 - Optimization
Lecture 21 - Optimization
Lecture 22 - Optimization
Lecture 23 - Optimization
Lecture 24 - Optimization
Lecture 25 - Optimization
Lecture 26 - Optimization
Lecture 27 - Optimization
Lecture 28 - Optimization
Lecture 29 - Optimization

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

Lecture 30 - Optimization
Lecture 31 - Optimization
Lecture 32 - Optimization
Lecture 33 - Optimization
Lecture 34 - Optimization
Lecture 35 - Optimization
Lecture 36 - Optimization
Lecture 37 - Optimization
Lecture 38 - Optimization

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

NPTEL Video Course - Mathematics - Probability Theory and Applications

Subject Co-ordinator - Prof. Prabha Sharma

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Basic principles of counting
- Lecture 2 - Sample space, events, axioms of probability
- Lecture 3 - Conditional probability, Independence of events
- Lecture 4 - Random variables, cumulative density function, expected value
- Lecture 5 - Discrete random variables and their distributions
- Lecture 6 - Discrete random variables and their distributions
- Lecture 7 - Discrete random variables and their distributions
- Lecture 8 - Continuous random variables and their distributions
- Lecture 9 - Continuous random variables and their distributions
- Lecture 10 - Continuous random variables and their distributions
- Lecture 11 - Function of random variables, Moment generating function
- Lecture 12 - Jointly distributed random variables, Independent r. v. and their sums
- Lecture 13 - Independent r. v. and their sums
- Lecture 14 - Chi square r. v., sums of independent normal r. v., Conditional distr
- Lecture 15 - Conditional distri, Joint distr. of functions of r. v., Order statistics
- Lecture 16 - Order statistics, Covariance and correlation
- Lecture 17 - Covariance, Correlation, Cauchy-Schwarz inequalities, Conditional expectation
- Lecture 18 - Conditional expectation, Best linear predictor
- Lecture 19 - Inequalities and bounds
- Lecture 20 - Convergence and limit theorems
- Lecture 21 - Central limit theorem
- Lecture 22 - Applications of central limit theorem
- Lecture 23 - Strong law of large numbers, Joint mgf
- Lecture 24 - Convolutions
- Lecture 25 - Stochastic processes
- Lecture 26 - Transition and state probabilities
- Lecture 27 - State prob., First passage and First return prob
- Lecture 28 - First passage and First return prob. Classification of states
- Lecture 29 - Random walk, periodic and null states

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Reducible Markov chains
- Lecture 31 - Time reversible Markov chains
- Lecture 32 - Poisson Processes
- Lecture 33 - Inter-arrival times, Properties of Poisson processes
- Lecture 34 - Queuing Models
- Lecture 35 - Analysis of L , L_q , W and W_q , M/M/S model
- Lecture 36 - M/M/S, M/M/I/K models
- Lecture 37 - M/M/I/K and M/M/S/K models
- Lecture 38 - Application to reliability theory failure law
- Lecture 39 - Exponential failure law, Weibull law
- Lecture 40 - Reliability of systems

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

NPTEL Video Course - Mathematics - NOC:Basic Calculus for Engineers, Scientists and Economists

Subject Co-ordinator - Dr. Joydeep Dutta

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Numbers
Lecture 2 - Functions-1
Lecture 3 - Sequence-1
Lecture 4 - Sequence-2
Lecture 5 - Limits and Continuity-1
Lecture 6 - Limits and Continuity-2
Lecture 7 - Limits And Continuity-3
Lecture 8 - Derivative-1
Lecture 9 - Derivative-2
Lecture 10 - Maxima And Minima
Lecture 11 - Mean-Value Theorem And Taylors Expansion-1
Lecture 12 - Mean-Value Theorem And Taylors Expansion-2
Lecture 13 - Integration-1
Lecture 14 - Integration-2
Lecture 15 - Integration By Parts
Lecture 16 - Definite Integral
Lecture 17 - Riemann Integration-1
Lecture 18 - Riemann Integration-2
Lecture 19 - Functions Of Two Or More Variables
Lecture 20 - Limits And Continuity Of Functions Of Two Variable
Lecture 21 - Differentiation Of Functions Of Two Variables-1
Lecture 22 - Differentiation Of Functions Of Two Variables-2
Lecture 23 - Unconstrained Minimization Of Funtions Of Two Variables
Lecture 24 - Constrained Minimization And Lagrange Multiplier Rules
Lecture 25 - Infinite Series-1
Lecture 26 - Infinite Series-2
Lecture 27 - Infinite Series-3
Lecture 28 - Multiple Integrals-1
Lecture 29 - Multiple Integrals-2

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

Lecture 30 - Multiple Integrals-3

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

NPTEL Video Course - Mathematics - NOC:Probability and Stochastics for finance

Subject Co-ordinator - Dr. Joydeep Dutta

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Basic Probability

Lecture 2 - Interesting Problems In Probability

Lecture 3 - Random variables, distribution function and independence

Lecture 4 - Chebyshev inequality, Borel-Cantelli Lemmas and related issues

Lecture 5 - Law of Large Number and Central Limit Theorem

Lecture 6 - Conditional Expectation - I

Lecture 7 - Conditional Expectation - II

Lecture 8 - Martingales

Lecture 9 - Brownian Motion - I

Lecture 10 - Brownian Motion - II

Lecture 11 - Brownian Motion - III

Lecture 12 - Ito Integral - I

Lecture 13 - Ito Integral - II

Lecture 14 - Ito Calculus - I

Lecture 15 - Ito Calculus - II

Lecture 16 - Ito Integral In Higher Dimension

Lecture 17 - Application to Ito Integral - I

Lecture 18 - Application to Ito Integral - II

Lecture 19 - Black Scholes Formula - I

Lecture 20 - Black Scholes Formula - II

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

NPTEL Video Course - Mathematics - NOC:Differential Calculus in Several Variables

Subject Co-ordinator - Prof. Sudipta Dutta

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction to Several Variables and Notion Of distance in R^n
- Lecture 2 - Countinuity And Compactness
- Lecture 3 - Countinuity And Connectdness
- Lecture 4 - Derivatives
- Lecture 5 - Matrix Of Linear Transformation
- Lecture 6 - Examples for Differentiable function
- Lecture 7 - Sufficient condition of differentiability
- Lecture 8 - Chain Rule
- Lecture 9 - Mean Value Theorem
- Lecture 10 - Higher Order Derivatives
- Lecture 11 - Taylor's Formula
- Lecture 12 - Maximum And Minimum
- Lecture 13 - Second derivative test for maximum, minimum and saddle point
- Lecture 14 - We formalise the second derivative test discussed in Lecture 2 and do examples
- Lecture 15 - Specialisation to functions of two variables
- Lecture 16 - Implicit Function Theorem
- Lecture 17 - Implicit Function Theorem -a
- Lecture 18 - Application of IFT
- Lecture 19 - Application of IFT
- Lecture 20 - Application of IFT
- Lecture 21 - Application of IFT

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

NPTEL Video Course - Mathematics - NOC:Curves and Surfaces

Subject Co-ordinator - Prof. Sudipta Dutta

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Level curves and locus, definition of parametric curves, tangent, arc length, arc length parameter
- Lecture 2 - How much a curve is \hat{A} curved \hat{A} , signed unit normal and signed curvature, rigid motions, constant
- Lecture 3 - Curves in R^3 , principal normal and binormal, torsion
- Lecture 4 - Frenet-Serret formula
- Lecture 5 - Simple closed curve and isoperimetric inequality
- Lecture 6 - Surfaces and parametric surfaces, examples, regular surface and non-example of regular surface, t
- Lecture 7 - Transition maps of smooth surfaces, smooth function between surfaces, diffeomorphism
- Lecture 8 - Reparameterization
- Lecture 9 - Tangent, Normal
- Lecture 10 - Orientable surfaces
- Lecture 11 - Examples of Surfaces
- Lecture 12 - First Fundamental Form
- Lecture 13 - Conformal Mapping
- Lecture 14 - Curvature of Surfaces
- Lecture 15 - Euler's Theorem
- Lecture 16 - Regular Surfaces locally as Quadratic Surfaces
- Lecture 17 - Geodesics
- Lecture 18 - Existence of Geodesics, Geodesics on Surfaces of revolution
- Lecture 19 - Geodesics on surfaces of revolution; Clairaut's Theorem
- Lecture 20 - Pseudosphere
- Lecture 21 - Classification of Quadratic Surface
- Lecture 22 - Surface Area and Equiareal Map

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

NPTEL Video Course - Mathematics - NOC:Linear Regression Analysis and Forecasting

Subject Co-ordinator - Prof. Shalabh

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Basic Fundamental Concepts Of Modelling

Lecture 2 - Regression Model - A Statistical Tool

Lecture 3 - Simple Linear Regression Analysis

Lecture 4 - Estimation Of Parameters In Simple Linear Regression Model

Lecture 5 - Estimation Of Parameters In Simple Linear Regression Model (Continued...)

Lecture 6 - Estimation Of Parameters In Simple Linear Regression Model (Continued...)

Lecture 7 - Maximum Likelihood Estimation of Parameters in Simple Linear Regression Model

Lecture 8 - Testing of Hypothesis and Confidence Interval Estimation in Simple Linear Regression Model

Lecture 9 - Testing of Hypothesis and Confidence Interval Estimation in Simple Linear Regression Model (Continued...)

Lecture 10 - Software Implementation in Simple Linear Regression Model using MINITAB

Lecture 11 - Multiple Linear Regression Model

Lecture 12 - Estimation of Model Parameters in Multiple Linear Regression Model

Lecture 13 - Estimation of Model Parameters in Multiple Linear Regression Model (Continued...)

Lecture 14 - Standardized Regression Coefficients and Testing of Hypothesis

Lecture 15 - Testing of Hypothesis (Continued...) and Goodness of Fit of the Model

Lecture 16 - Diagnostics in Multiple Linear Regression Model

Lecture 17 - Diagnostics in Multiple Linear Regression Model (Continued...)

Lecture 18 - Diagnostics in Multiple Linear Regression Model (Continued...)

Lecture 19 - Software Implementation of Multiple Linear Regression Model using MINITAB

Lecture 20 - Software Implementation of Multiple Linear Regression Model using MINITAB (Continued...)

Lecture 21 - Forecasting in Multiple Linear Regression Model

Lecture 22 - Within Sample Forecasting

Lecture 23 - Outside Sample Forecasting

Lecture 24 - Software Implementation of Forecasting using MINITAB

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

NPTEL Video Course - Mathematics - NOC:Introduction to R Software

Subject Co-ordinator - Prof. Shalabh

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - How to Learn and Follow the Course

Lecture 2 - Why R and Installation Procedure

Lecture 3 - Introduction _Help_ Demo examples_ packages_ libraries

Lecture 4 - Introduction _Command line_ Data editor _ Rstudio

Lecture 5 - Basics in Calculations

Lecture 6 - Basics of Calculations _ Calculator _Built in Functions Assignments

Lecture 7 - Basics of Calculations _Functions _Matrices

Lecture 8 - Basics Calculations

Lecture 9 - Basics Calculations

Lecture 10 - Basics Calculations

Lecture 11 - Basics Calculations

Lecture 12 - Basics Calculations

Lecture 13 - Basics Calculations

Lecture 14 - Basics Calculations

Lecture 15 - Data management - Sequences

Lecture 16 - Data management - sequences

Lecture 17 - Data management - Repeats

Lecture 18 - Data management - Sorting and Ordering

Lecture 19 - Data management - Lists

Lecture 20 - Data management - Lists (Continued...)

Lecture 21 - Data management - Vector indexing

Lecture 22 - Data management - Vector Indexing (Continued...)

Lecture 23 - Data management - Factors

Lecture 24 - Data management - factors (Continued...)

Lecture 25 - Strings - Display and Formatting, Print and Format Functions

Lecture 26 - Strings - Display and Formatting, Print and Format with Concatenate

Lecture 27 - Strings - Display and Formatting, Paste Function

Lecture 28 - Strings - Display and Formatting, Splitting

Lecture 29 - Strings - Display and Formatting, Replacement_ Manipulations _Alphabets

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Strings - Display and Formatting, Replacement and Evaluation of Strings
- Lecture 31 - Data frames
- Lecture 32 - Data frames (Continued...)
- Lecture 33 - Data frames (Continued...)
- Lecture 34 - Data Handling - Importing CSV and Tabular Data Files
- Lecture 35 - Data Handling - Importing Data Files from Other Software
- Lecture 36 - Statistical Functions - Frequency and Partition values
- Lecture 37 - Statistical Functions - Graphics and Plots
- Lecture 38 - Statistical Functions - Central Tendency and Variation
- Lecture 39 - Statistical Functions - Boxplots, Skewness and Kurtosis
- Lecture 40 - Statistical Functions - Bivariate three dimensional plot
- Lecture 41 - Statistical Functions - Correlation and Examples of Programming
- Lecture 42 - Examples of Programming
- Lecture 43 - Examples of More Programming

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

NPTEL Video Course - Mathematics - NOC:Descriptive Statistics with R Software

Subject Co-ordinator - Prof. Shalabh

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction to R Software
- Lecture 2 - Basics and R as a Calculator
- Lecture 3 - Calculations with Data Vectors
- Lecture 4 - Built-in Commands and Missing Data Handling
- Lecture 5 - Operations with Matrices
- Lecture 6 - Objectives, Steps and Basic Definitions
- Lecture 7 - Variables and Types of Data
- Lecture 8 - Absolute Frequency, Relative Frequency and Frequency Distribution
- Lecture 9 - Frequency Distribution and Cumulative Distribution Function
- Lecture 10 - Bar Diagrams
- Lecture 11 - Subdivided Bar Plots and Pie Diagrams
- Lecture 12 - 3D Pie Diagram and Histogram
- Lecture 13 - Kernel Density and Stem - Leaf Plots
- Lecture 14 - Arithmetic Mean
- Lecture 15 - Median
- Lecture 16 - Quantiles
- Lecture 17 - Mode, Geometric Mean and Harmonic Mean
- Lecture 18 - Range, Interquartile Range and Quartile Deviation
- Lecture 19 - Absolute Deviation and Absolute Mean Deviation
- Lecture 20 - Mean Squared Error, Variance and Standard Deviation
- Lecture 21 - Coefficient of Variation and Boxplots
- Lecture 22 - Raw and Central Moments
- Lecture 23 - Sheppard's Correction, Absolute Moments and Computation of Moments
- Lecture 24 - Skewness and Kurtosis
- Lecture 25 - Univariate and Bivariate Scatter Plots
- Lecture 26 - Smooth Scatter Plots
- Lecture 27 - Quantile-Quantile and Three Dimensional Plots
- Lecture 28 - Correlation Coefficient
- Lecture 29 - Correlation Coefficient Using R Software

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Rank Correlation Coefficient
- Lecture 31 - Measures of Association for Discrete and Counting Variables - Part 1
- Lecture 32 - Measures of Association for Discrete and Counting Variables - Part 2
- Lecture 33 - Least Squares Method - One Variable
- Lecture 34 - Least Squares Method - R Commands and More than One Variables

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

NPTEL Video Course - Mathematics - Advanced Engineering Mathematics

Subject Co-ordinator - Dr. P. Panigrahi, Prof. J. Kumar, Prof. P.D. Srivastava, Prof. Somesh Kumar

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Review Groups, Fields and Matrices
- Lecture 2 - Vector Spaces, Subspaces, Linearly Dependent/Independent of Vectors
- Lecture 3 - Basis, Dimension, Rank and Matrix Inverse
- Lecture 4 - Linear Transformation, Isomorphism and Matrix Representation
- Lecture 5 - System of Linear Equations, Eigenvalues and Eigenvectors
- Lecture 6 - Method to Find Eigenvalues and Eigenvectors, Diagonalization of Matrices
- Lecture 7 - Jordan Canonical Form, Cayley Hamilton Theorem
- Lecture 8 - Inner Product Spaces, Cauchy-Schwarz Inequality
- Lecture 9 - Orthogonality, Gram-Schmidt Orthogonalization Process
- Lecture 10 - Spectrum of special matrices, positive/negative definite matrices
- Lecture 11 - Concept of Domain, Limit, Continuity and Differentiability
- Lecture 12 - Analytic Functions, C-R Equations
- Lecture 13 - Harmonic Functions
- Lecture 14 - Line Integral in the Complex
- Lecture 15 - Cauchy Integral Theorem
- Lecture 16 - Cauchy Integral Theorem (Continued.)
- Lecture 17 - Cauchy Integral Formula
- Lecture 18 - Power and Taylor's Series of Complex Numbers
- Lecture 19 - Power and Taylor's Series of Complex Numbers (Continued.)
- Lecture 20 - Taylor's, Laurent Series of $f(z)$ and Singularities
- Lecture 21 - Classification of Singularities, Residue and Residue Theorem
- Lecture 22 - Laplace Transform and its Existence
- Lecture 23 - Properties of Laplace Transform
- Lecture 24 - Evaluation of Laplace and Inverse Laplace Transform
- Lecture 25 - Applications of Laplace Transform to Integral Equations and ODEs
- Lecture 26 - Applications of Laplace Transform to PDEs
- Lecture 27 - Fourier Series
- Lecture 28 - Fourier Series (Continued.)
- Lecture 29 - Fourier Integral Representation of a Function

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Introduction to Fourier Transform
- Lecture 31 - Applications of Fourier Transform to PDEs
- Lecture 32 - Laws of Probability - I
- Lecture 33 - Laws of Probability - II
- Lecture 34 - Problems in Probability
- Lecture 35 - Random Variables
- Lecture 36 - Special Discrete Distributions
- Lecture 37 - Special Continuous Distributions
- Lecture 38 - Joint Distributions and Sampling Distributions
- Lecture 39 - Point Estimation
- Lecture 40 - Interval Estimation
- Lecture 41 - Basic Concepts of Testing of Hypothesis
- Lecture 42 - Tests for Normal Populations

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

NPTEL Video Course - Mathematics - Functional Analysis

Subject Co-ordinator - Prof. P.D. Srivastava

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Metric Spaces with Examples
- Lecture 2 - Holder Inequality and Minkowski Inequality
- Lecture 3 - Various Concepts in a Metric Space
- Lecture 4 - Separable Metrics Spaces with Examples
- Lecture 5 - Convergence, Cauchy Sequence, Completeness
- Lecture 6 - Examples of Complete and Incomplete Metric Spaces
- Lecture 7 - Completion of Metric Spaces + Tutorial
- Lecture 8 - Vector Spaces with Examples
- Lecture 9 - Normed Spaces with Examples
- Lecture 10 - Banach Spaces and Schauder Basis
- Lecture 11 - Finite Dimensional Normed Spaces and Subspaces
- Lecture 12 - Compactness of Metric/Normed Spaces
- Lecture 13 - Linear Operators-definition and Examples
- Lecture 14 - Bounded Linear Operators in a Normed Space
- Lecture 15 - Bounded Linear Functionals in a Normed Space
- Lecture 16 - Concept of Algebraic Dual and Reflexive Space
- Lecture 17 - Dual Basis & Algebraic Reflexive Space
- Lecture 18 - Dual Spaces with Examples
- Lecture 19 - Tutorial - I
- Lecture 20 - Tutorial - II
- Lecture 21 - Inner Product & Hilbert Space
- Lecture 22 - Further Properties of Inner Product Spaces
- Lecture 23 - Projection Theorem, Orthonormal Sets and Sequences
- Lecture 24 - Representation of Functionals on a Hilbert Spaces
- Lecture 25 - Hilbert Adjoint Operator
- Lecture 26 - Self Adjoint, Unitary & Normal Operators
- Lecture 27 - Tutorial - III
- Lecture 28 - Annihilator in an IPS
- Lecture 29 - Total Orthonormal Sets And Sequences

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Partially Ordered Set and Zorns Lemma
- Lecture 31 - Hahn Banach Theorem for Real Vector Spaces
- Lecture 32 - Hahn Banach Theorem for Complex V.S. & Normed Spaces
- Lecture 33 - Baires Category & Uniform Boundedness Theorems
- Lecture 34 - Open Mapping Theorem
- Lecture 35 - Closed Graph Theorem
- Lecture 36 - Adjoint Operator
- Lecture 37 - Strong and Weak Convergence
- Lecture 38 - Convergence of Sequence of Operators and Functionals
- Lecture 39 - LP - Space
- Lecture 40 - LP - Space (Continued.)

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

NPTEL Video Course - Mathematics - Numerical methods of Ordinary and Partial Differential Equations

Subject Co-ordinator - Dr. G.P. Raja Sekhar

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Motivation with few Examples
- Lecture 2 - Single - Step Methods for IVPs
- Lecture 3 - Analysis of Single Step Methods
- Lecture 4 - Runge - Kutta Methods for IVPs
- Lecture 5 - Higher Order Methods/Equations
- Lecture 6 - Error - Stability - Convergence of Single Step Methods
- Lecture 7 - Tutorial - I
- Lecture 8 - Tutorial - II
- Lecture 9 - Multi-Step Methods (Explicit)
- Lecture 10 - Multi-Step Methods (Implicit)
- Lecture 11 - Convergence and Stability of multi step methods
- Lecture 12 - General methods for absolute stability
- Lecture 13 - Stability Analysis of Multi Step Methods
- Lecture 14 - Predictor - Corrector Methods
- Lecture 15 - Some Comments on Multi - Step Methods
- Lecture 16 - Finite Difference Methods - Linear BVPs
- Lecture 17 - Linear/Non - Linear Second Order BVPs
- Lecture 18 - BVPS - Derivative Boundary Conditions
- Lecture 19 - Higher Order BVPs
- Lecture 20 - Shooting Method BVPs
- Lecture 21 - Tutorial - III
- Lecture 22 - Introduction to First Order PDE
- Lecture 23 - Introduction to Second Order PDE
- Lecture 24 - Finite Difference Approximations to Parabolic PDEs
- Lecture 25 - Implicit Methods for Parabolic PDEs
- Lecture 26 - Consistency, Stability and Convergence
- Lecture 27 - Other Numerical Methods for Parabolic PDEs
- Lecture 28 - Tutorial - IV
- Lecture 29 - Matrix Stability Analysis of Finite Difference Scheme

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Fourier Series Stability Analysis of Finite Difference Scheme
- Lecture 31 - Finite Difference Approximations to Elliptic PDEs - I
- Lecture 32 - Finite Difference Approximations to Elliptic PDEs - II
- Lecture 33 - Finite Difference Approximations to Elliptic PDEs - III
- Lecture 34 - Finite Difference Approximations to Elliptic PDEs - IV
- Lecture 35 - Finite Difference Approximations to Hyperbolic PDEs - I
- Lecture 36 - Finite Difference Approximations to Hyperbolic PDEs - II
- Lecture 37 - Method of characteristics for Hyperbolic PDEs - I
- Lecture 38 - Method of characteristics for Hyperbolic PDEs - II
- Lecture 39 - Finite Difference Approximations to 1st order Hyperbolic PDEs
- Lecture 40 - Summary, Appendices, Remarks

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

NPTEL Video Course - Mathematics - Optimization

Subject Co-ordinator - Prof. A. Goswami, Dr. Debjani Chakraborty

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Optimization - Introduction
- Lecture 2 - Formulation of LPP
- Lecture 3 - Geometry of LPP and Graphical Solution of LPP
- Lecture 4 - Solution of LPP
- Lecture 5 - Big - M Method
- Lecture 6 - Two - Phase Method
- Lecture 7 - Special Cases in Simple Applications
- Lecture 8 - Introduction to Duality Theory
- Lecture 9 - Dual Simplex Method
- Lecture 10 - Post Optimality Analysis
- Lecture 11 - Integer Programming - I
- Lecture 12 - Integer Programming - II
- Lecture 13 - Introduction to Transportation Problems
- Lecture 14 - Solving Various types of Transportation Problems
- Lecture 15 - Assignment Problems
- Lecture 16 - Project Management
- Lecture 17 - Critical Path Analysis
- Lecture 18 - PERT
- Lecture 19 - Shortest Path Algorithm
- Lecture 20 - Travelling Salesman Problem
- Lecture 21 - Classical optimization techniques
- Lecture 22 - Unconstrained multivariable optimization
- Lecture 23 - Nonlinear programming with equality constraint
- Lecture 24 - Nonlinear programming KKT conditions
- Lecture 25 - Numerical optimization
- Lecture 26 - Numerical optimization
- Lecture 27 - Fibonacci Method
- Lecture 28 - Golden Section Methods
- Lecture 29 - Interpolation Methods

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Unconstrained optimization techniques
- Lecture 31 - Unconstrained optimization techniques
- Lecture 32 - Nonlinear programming
- Lecture 33 - Interior and Exterior penalty Function Method
- Lecture 34 - Separable Programming Problem
- Lecture 35 - Introduction to Geometric Programming
- Lecture 36 - Constrained Geometric Programming Problem
- Lecture 37 - Dynamic Programming Problem
- Lecture 38 - Dynamic Programming Problem (Continued.)
- Lecture 39 - Multi Objective Decision Making
- Lecture 40 - Multi attribute decision making

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

NPTEL Video Course - Mathematics - Probability and Statistics

Subject Co-ordinator - Prof. Somesh Kumar

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Algebra of Sets - I
Lecture 2 - Algebra of Sets - II
Lecture 3 - Introduction to Probability
Lecture 4 - Laws of Probability - I
Lecture 5 - Laws of Probability - II
Lecture 6 - Problems in Probability
Lecture 7 - Random Variables
Lecture 8 - Probability Distributions
Lecture 9 - Characteristics of Distribution
Lecture 10 - Special Distributions - I
Lecture 11 - Special Distributions - II
Lecture 12 - Special Distributions - III
Lecture 13 - Special Distributions - IV
Lecture 14 - Special Distributions - V
Lecture 15 - Special Distributions - VI
Lecture 16 - Special Distributions - VII
Lecture 17 - Functions of a Random Variable
Lecture 18 - Joint Distributions - I
Lecture 19 - Joint Distributions - II
Lecture 20 - Joint Distributions - III
Lecture 21 - Joint Distributions - IV
Lecture 22 - Transformations of Random Vectors
Lecture 23 - Sampling Distributions - I
Lecture 24 - Sampling Distributions - II
Lecture 25 - Descriptive Statistics - I
Lecture 26 - Descriptive Statistics - II
Lecture 27 - Estimation - I
Lecture 28 - Estimation - II
Lecture 29 - Estimation - III

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Estimation - IV
- Lecture 31 - Estimation - V
- Lecture 32 - Estimation - VI
- Lecture 33 - Testing of Hypothesis - I
- Lecture 34 - Testing of Hypothesis - II
- Lecture 35 - Testing of Hypothesis - III
- Lecture 36 - Testing of Hypothesis - IV
- Lecture 37 - Testing of Hypothesis - V
- Lecture 38 - Testing of Hypothesis - VI
- Lecture 39 - Testing of Hypothesis - VII
- Lecture 40 - Testing of Hypothesis - VIII

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

NPTEL Video Course - Mathematics - Regression Analysis

Subject Co-ordinator - Dr. Soumen Maity

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Simple Linear Regression
- Lecture 2 - Simple Linear Regression (Continued...1)
- Lecture 3 - Simple Linear Regression (Continued...2)
- Lecture 4 - Simple Linear Regression (Continued...3)
- Lecture 5 - Simple Linear Regression (Continued...4)
- Lecture 6 - Multiple Linear Regression
- Lecture 7 - Multiple Linear Regression (Continued...1)
- Lecture 8 - Multiple Linear Regression (Continued...2)
- Lecture 9 - Multiple Linear Regression (Continued...3)
- Lecture 10 - Selecting the BEST Regression model
- Lecture 11 - Selecting the BEST Regression model (Continued...1)
- Lecture 12 - Selecting the BEST Regression model (Continued...2)
- Lecture 13 - Selecting the BEST Regression model (Continued...3)
- Lecture 14 - Multicollinearity
- Lecture 15 - Multicollinearity (Continued...1)
- Lecture 16 - Multicollinearity (Continued...2)
- Lecture 17 - Model Adequacy Checking
- Lecture 18 - Model Adequacy Checking (Continued...1)
- Lecture 19 - Model Adequacy Checking (Continued...2)
- Lecture 20 - Test for Influential Observations
- Lecture 21 - Transformations and Weighting to correct model inadequacies
- Lecture 22 - Transformations and Weighting to correct model inadequacies (Continued...1)
- Lecture 23 - Transformations and Weighting to correct model inadequacies (Continued...2)
- Lecture 24 - Dummy Variables
- Lecture 25 - Dummy Variables (Continued...1)
- Lecture 26 - Dummy Variables (Continued...2)
- Lecture 27 - Polynomial Regression Models
- Lecture 28 - Polynomial Regression Models (Continued...1)
- Lecture 29 - Polynomial Regression Models (Continued...2)

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Generalized Linear Models
- Lecture 31 - Generalized Linear Models (Continued.)
- Lecture 32 - Non-Linear Estimation
- Lecture 33 - Regression Models with Autocorrelated Errors
- Lecture 34 - Regression Models with Autocorrelated Errors (Continued.)
- Lecture 35 - Measurement Errors & Calibration Problem
- Lecture 36 - Tutorial - I
- Lecture 37 - Tutorial - II
- Lecture 38 - Tutorial - III
- Lecture 39 - Tutorial - IV
- Lecture 40 - Tutorial - V

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

NPTEL Video Course - Mathematics - Statistical Inference

Subject Co-ordinator - Prof. Somesh Kumar

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction and Motivation
Lecture 2 - Basic Concepts of Point Estimations - I
Lecture 3 - Basic Concepts of Point Estimations - II
Lecture 4 - Finding Estimators - I
Lecture 5 - Finding Estimators - II
Lecture 6 - Finding Estimators - III
Lecture 7 - Properties of MLEs
Lecture 8 - Lower Bounds for Variance - I
Lecture 9 - Lower Bounds for Variance - II
Lecture 10 - Lower Bounds for Variance - III
Lecture 11 - Lower Bounds for Variance - IV
Lecture 12 - Sufficiency
Lecture 13 - Sufficiency and Information
Lecture 14 - Minimal Sufficiency, Completeness
Lecture 15 - UMVU Estimation, Ancillarity
Lecture 16 - Invariance - I
Lecture 17 - Invariance - II
Lecture 18 - Bayes and Minimax Estimation - I
Lecture 19 - Bayes and Minimax Estimation - II
Lecture 20 - Bayes and Minimax Estimation - III
Lecture 21 - Testing of Hypotheses
Lecture 22 - Neyman Pearson Fundamental Lemma
Lecture 23 - Applications of NP lemma
Lecture 24 - UMP Tests
Lecture 25 - UMP Tests (Continued.)
Lecture 26 - UMP Unbiased Tests
Lecture 27 - UMP Unbiased Tests (Continued.)
Lecture 28 - UMP Unbiased Tests
Lecture 29 - Unbiased Tests for Normal Populations

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Unbiased Tests for Normal Populations (Continued.)
- Lecture 31 - Likelihood Ratio Tests - I
- Lecture 32 - Likelihood Ratio Tests - II
- Lecture 33 - Likelihood Ratio Tests - III
- Lecture 34 - Likelihood Ratio Tests - IV
- Lecture 35 - Invariant Tests
- Lecture 36 - Test for Goodness of Fit
- Lecture 37 - Sequential Procedure
- Lecture 38 - Sequential Procedure (Continued.)
- Lecture 39 - Confidence Intervals
- Lecture 40 - Confidence Intervals (Continued.)

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

NPTEL Video Course - Mathematics - A Basic Course in Real Analysis

Subject Co-ordinator - Prof. P.D. Srivastava

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Rational Numbers and Rational Cuts

Lecture 2 - Irrational numbers, Dedekind's Theorem

Lecture 3 - Continuum and Exercises

Lecture 4 - Continuum and Exercises (Continued.)

Lecture 5 - Cantor's Theory of Irrational Numbers

Lecture 6 - Cantor's Theory of Irrational Numbers (Continued.)

Lecture 7 - Equivalence of Dedekind and Cantor's Theory

Lecture 8 - Finite, Infinite, Countable and Uncountable Sets of Real Numbers

Lecture 9 - Types of Sets with Examples, Metric Space

Lecture 10 - Various properties of open set, closure of a set

Lecture 11 - Ordered set, Least upper bound, greatest lower bound of a set

Lecture 12 - Compact Sets and its properties

Lecture 13 - Weiersstrass Theorem, Heine Borel Theorem, Connected set

Lecture 14 - Tutorial - II

Lecture 15 - Concept of limit of a sequence

Lecture 16 - Some Important limits, Ratio tests for sequences of Real Numbers

Lecture 17 - Cauchy theorems on limit of sequences with examples

Lecture 18 - Fundamental theorems on limits, Bolzano-Weiersstrass Theorem

Lecture 19 - Theorems on Convergent and divergent sequences

Lecture 20 - Cauchy sequence and its properties

Lecture 21 - Infinite series of real numbers

Lecture 22 - Comparison tests for series, Absolutely convergent and Conditional convergent series

Lecture 23 - Tests for absolutely convergent series

Lecture 24 - Raabe's test, limit of functions, Cluster point

Lecture 25 - Some results on limit of functions

Lecture 26 - Limit Theorems for functions

Lecture 27 - Extension of limit concept (one sided limits)

Lecture 28 - Continuity of Functions

Lecture 29 - Properties of Continuous Functions

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Boundedness Theorem, Max-Min Theorem and Bolzano's theorem
- Lecture 31 - Uniform Continuity and Absolute Continuity
- Lecture 32 - Types of Discontinuities, Continuity and Compactness
- Lecture 33 - Continuity and Compactness (Continued.), Connectedness
- Lecture 34 - Differentiability of real valued function, Mean Value Theorem
- Lecture 35 - Mean Value Theorem (Continued.)
- Lecture 36 - Application of MVT , Darboux Theorem, L Hospital Rule
- Lecture 37 - L'Hospital Rule and Taylor's Theorem
- Lecture 38 - Tutorial - III
- Lecture 39 - Riemann/Riemann Stieltjes Integral
- Lecture 40 - Existence of Reimann Stieltjes Integral
- Lecture 41 - Properties of Reimann Stieltjes Integral
- Lecture 42 - Properties of Reimann Stieltjes Integral (Continued.)
- Lecture 43 - Definite and Indefinite Integral
- Lecture 44 - Fundamental Theorems of Integral Calculus
- Lecture 45 - Improper Integrals
- Lecture 46 - Convergence Test for Improper Integrals

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

NPTEL Video Course - Mathematics - Statistical Methods for Scientists and Engineers

Subject Co-ordinator - Prof. Somesh Kumar

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Foundations of Probability
- Lecture 2 - Laws of Probability
- Lecture 3 - Random Variables
- Lecture 4 - Moments and Special Distributions
- Lecture 5 - Moments and Special Distributions (Continued...)
- Lecture 6 - Special Distributions (Continued...)
- Lecture 7 - Special Distributions (Continued...)
- Lecture 8 - Sampling Distributions
- Lecture 9 - Parametric Methods - I
- Lecture 10 - Parametric Methods - II
- Lecture 11 - Parametric Methods - III
- Lecture 12 - Parametric Methods - IV
- Lecture 13 - Parametric Methods - V
- Lecture 14 - Parametric Methods - VI
- Lecture 15 - Parametric Methods - VII
- Lecture 16 - Multivariate Analysis - I
- Lecture 17 - Multivariate Analysis - II
- Lecture 18 - Multivariate Analysis - III
- Lecture 19 - Multivariate Analysis - IV
- Lecture 20 - Multivariate Analysis - V
- Lecture 21 - Multivariate Analysis - VI
- Lecture 22 - Multivariate Analysis - VII
- Lecture 23 - Multivariate Analysis - VIII
- Lecture 24 - Multivariate Analysis - IX
- Lecture 25 - Multivariate Analysis - X
- Lecture 26 - Multivariate Analysis - XI
- Lecture 27 - Multivariate Analysis - XII
- Lecture 28 - Non parametric Methods - I
- Lecture 29 - Non parametric Methods - II

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Non parametric Methods - III
- Lecture 31 - Non parametric Methods - IV
- Lecture 32 - Nonparametric Methods - V
- Lecture 33 - Nonparametric Methods - VI
- Lecture 34 - Nonparametric Methods - VII
- Lecture 35 - Nonparametric Methods - VIII
- Lecture 36 - Nonparametric Methods - IX
- Lecture 37 - Nonparametric Methods - X
- Lecture 38 - Nonparametric Methods - XI
- Lecture 39 - Nonparametric Methods - XII
- Lecture 40 - Nonparametric Methods - XIII

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

NPTEL Video Course - Mathematics - NOC:Probability and Statistics

Subject Co-ordinator - Prof. Somesh Kumar

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Sets, Classes, Collection
Lecture 2 - Sequence of Sets
Lecture 3 - Ring, Field (Algebra)
Lecture 4 - Sigma-Ring, Sigma-Field, Monotone Class
Lecture 5 - Random Experiment, Events
Lecture 6 - Definitions of Probability
Lecture 7 - Properties of Probability Function - I
Lecture 8 - Properties of Probability Function - II
Lecture 9 - Conditional Probability
Lecture 10 - Independence of Events
Lecture 11 - Problems in Probability - I
Lecture 12 - Problems in Probability - II
Lecture 13 - Random Variables
Lecture 14 - Probability Distribution of a Random Variable - I
Lecture 15 - Probability Distribution of a Random Variable - II
Lecture 16 - Moments
Lecture 17 - Characteristics of Distributions - I
Lecture 18 - Characteristics of Distributions - II
Lecture 19 - Special Discrete Distributions - I
Lecture 20 - Special Discrete Distributions - II
Lecture 21 - Special Discrete Distributions - III
Lecture 22 - Poisson Process - I
Lecture 23 - Poisson Process - II
Lecture 24 - Special Continuous Distributions - I
Lecture 25 - Special Continuous Distributions - II
Lecture 26 - Special Continuous Distributions - III
Lecture 27 - Special Continuous Distributions - IV
Lecture 28 - Special Continuous Distributions - V
Lecture 29 - Normal Distribution

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Problems on Normal Distribution
- Lecture 31 - Problems on Special Distributions - I
- Lecture 32 - Problems on Special Distributions - II
- Lecture 33 - Function of a random variable - I
- Lecture 34 - Function of a random variable - II
- Lecture 35 - Joint Distributions - I
- Lecture 36 - Joint Distributions - II
- Lecture 37 - Independence, Product Moments
- Lecture 38 - Linearity Property of Correlation and Examples
- Lecture 39 - Bivariate Normal Distribution - I
- Lecture 40 - Bivariate Normal Distribution - II
- Lecture 41 - Additive Properties of Distributions - I
- Lecture 42 - Additive Properties of Distributions - II
- Lecture 43 - Transformation of Random Variables
- Lecture 44 - Distribution of Order Statistics
- Lecture 45 - Basic Concepts
- Lecture 46 - Chi-Square Distribution
- Lecture 47 - Chi-Square Distribution (Continued...), t-Distribution
- Lecture 48 - F-Distribution
- Lecture 49 - Descriptive Statistics - I
- Lecture 50 - Descriptive Statistics - II
- Lecture 51 - Descriptive Statistics - III
- Lecture 52 - Descriptive Statistics - IV
- Lecture 53 - Introduction to Estimation
- Lecture 54 - Unbiased and Consistent Estimators
- Lecture 55 - LSE, MME
- Lecture 56 - Examples on MME, MLE
- Lecture 57 - Examples on MLE - I
- Lecture 58 - Examples on MLE - II, MSE
- Lecture 59 - UMVUE, Sufficiency, Completeness
- Lecture 60 - Rao - Blackwell Theorem and Its Applications
- Lecture 61 - Confidence Intervals - I
- Lecture 62 - Confidence Intervals - II
- Lecture 63 - Confidence Intervals - III
- Lecture 64 - Confidence Intervals - IV
- Lecture 65 - Basic Definitions
- Lecture 66 - Two Types of Errors
- Lecture 67 - Neyman-Pearson Fundamental Lemma
- Lecture 68 - Applications of N-P Lemma - I

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 69 - Applications of N-P Lemma - II
- Lecture 70 - Testing for Normal Mean
- Lecture 71 - Testing for Normal Variance
- Lecture 72 - Large Sample Test for Variance and Two Sample Problem
- Lecture 73 - Paired t-Test
- Lecture 74 - Examples
- Lecture 75 - Testing Equality of Proportions
- Lecture 76 - Chi-Square Test for Goodness Fit - I
- Lecture 77 - Chi-Square Test for Goodness Fit - II
- Lecture 78 - Testing for Independence in rxc Contingency Table - I
- Lecture 79 - Testing for Independence in rxc Contingency Table - II

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

NPTEL Video Course - Mathematics - NOC:Applied Multivariate Statistical Modeling

Subject Co-ordinator - Dr. J. Maiti

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction to multivariate statistical modeling - Part-I
Lecture 2 - Introduction to multivariate statistical modeling - Part-II
Lecture 3 - Univariate descriptive statistics
Lecture 4 - Sampling Distribution
Lecture 5 - Estimation - Part-I
Lecture 6 - Estimation - Part-II
Lecture 7 - Hypothesis Testing
Lecture 8 - Introduction to multivariate statistical modeling - Part-I
Lecture 9 - Introduction to multivariate statistical modeling - Part-II
Lecture 10 - Multivariate Normal Distribution
Lecture 11 - Multivariate Normal Distribution (Continued...)
Lecture 12 - ANOVA - Part-I
Lecture 13 - ANOVA - Part-II
Lecture 14 - Multivariate Analysis of Variance (MANOVA)
Lecture 15 - Multivariate Analysis of Variance (MANOVA) (Continued...)
Lecture 16 - Multiple Regression - Introduction
Lecture 17 - MLR Sampling Distribution of Regression Coefficients
Lecture 18 - MLR-Model Adequacy Tests
Lecture 19 - MLR - Test of Assumptions
Lecture 20 - MLR - Model Diagnostics
Lecture 21 - Principal Component Analysis (PCA)
Lecture 22 - Principal Component Analysis (PCA)
Lecture 23 - Factor Analysis
Lecture 24 - Factor Analysis - Estimation and Model Adequacy Testing
Lecture 25 - Factor Analysis - Model Adequacy, Rotation, Factor Scores and Case Study
Lecture 26 - Introduction to Structural Equation Modeling
Lecture 27 - SEM - Measurement Model
Lecture 28 - SEM - Structural Model

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

NPTEL Video Course - Mathematics - NOC:Partial Differential Equations (PDE) for Engineers: Solution by Separation of Variables

Subject Co-ordinator - Prof. S. De

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction to PDE

Lecture 2 - Classification of PDE

Lecture 3 - Principle of Linear Superposition

Lecture 4 - Standard Eigen Value Problem and Special ODEs

Lecture 5 - Adjoint Operator

Lecture 6 - Generalized Sturm - Liouville Problem

Lecture 7 - Properties of Adjoint Operator

Lecture 8 - Separation of Variables

Lecture 9 - Solution of 3 Dimensional Parabolic Problem

Lecture 10 - Solution of 4 Dimensional Parabolic problem

Lecture 11 - Solution of 4 Dimensional Parabolic Problem (Continued...)

Lecture 12 - Solution of Elliptical PDE

Lecture 13 - Solution of Hyperbolic PDE

Lecture 14 - Orthogonality of Bessel Function and 2 Dimensional Cylindrical Coordinate System

Lecture 15 - Cylindrical Co-ordinate System - 3 Dimensional Problem

Lecture 16 - Spherical Polar Coordinate System

Lecture 17 - Spherical Polar Coordinate System (Continued...)

Lecture 18 - Example of Generalized 3 Dimensional Problem

Lecture 19 - Example of Application Oriented Problems

Lecture 20 - Examples of Application Oriented Problems (Continued...)

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

NPTEL Video Course - Mathematics - NOC: Introductory Course in Real Analysis

Subject Co-ordinator - Prof. P.D. Srivastava

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Countable and Uncountable sets
- Lecture 2 - Properties of Countable and Uncountable sets
- Lecture 3 - Examples of Countable and Uncountable sets
- Lecture 4 - Concepts of Metric Space
- Lecture 5 - Open ball, Closed ball, Limit point of a set
- Lecture 6 - Tutorial-I
- Lecture 7 - Some theorems on Open and Closed sets
- Lecture 8 - Ordered set, Least upper bound, Greatest lower bound of a set
- Lecture 9 - Ordered set, Least upper bound, Greatest lower bound of a set (Continued...)
- Lecture 10 - Compact Set
- Lecture 11 - Properties of Compact sets
- Lecture 12 - Tutorial-II
- Lecture 13 - Heine Borel Theorem
- Lecture 14 - Weierstrass Theorem
- Lecture 15 - Cantor set and its properties
- Lecture 16 - Derived set and Dense set
- Lecture 17 - Limit of a sequence and monotone sequence
- Lecture 18 - Tutorial-III
- Lecture 19 - Some Important limits of sequences
- Lecture 20 - Ratio Test Cauchy's theorems on limits of sequences of real numbers
- Lecture 21 - Fundamental theorems on limits
- Lecture 22 - Some results on limits and Bolzano-Weierstrass Theorem
- Lecture 23 - Criteria for convergent sequence
- Lecture 24 - Tutorial-IV
- Lecture 25 - Criteria for Divergent Sequence
- Lecture 26 - Cauchy Sequence
- Lecture 27 - Cauchy Convergence Criteria for Sequences
- Lecture 28 - Infinite Series of Real Numbers
- Lecture 29 - Convergence Criteria for Series of Positive Real Numbers

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Tutorial-V
- Lecture 31 - Comparison Test for Series
- Lecture 32 - Absolutely and Conditionally Convergent Series
- Lecture 33 - Rearrangement Theorem and Test for Convergence of Series
- Lecture 34 - Ratio and Integral Test for Convergence of Series
- Lecture 35 - Raabe's Test for Convergence of Series
- Lecture 36 - Tutorial-VI
- Lecture 37 - Limit of Functions and Cluster Point
- Lecture 38 - Limit of Functions (Continued...)
- Lecture 39 - Divergence Criteria for Limit
- Lecture 40 - Various Properties of Limit of Functions
- Lecture 41 - Left and Right Hand Limits for Functions
- Lecture 42 - Tutorial-VII
- Lecture 43 - Limit of Functions at Infinity
- Lecture 44 - Continuous Functions (Cauchy's Definition)
- Lecture 45 - Continuous Functions (Heine's Definition)
- Lecture 46 - Properties of Continuous Functions
- Lecture 47 - Properties of Continuous Functions (Continued...)
- Lecture 48 - Tutorial-VIII
- Lecture 49 - Boundness Theorem and Max-Min Theorem
- Lecture 50 - Location of Root and Bolzano's Theorem
- Lecture 51 - Uniform Continuity and Related Theorems
- Lecture 52 - Absolute Continuity and Related Theorems
- Lecture 53 - Types of Discontinuities
- Lecture 54 - Tutorial-IX
- Lecture 55 - Types of Discontinuities (Continued...)
- Lecture 56 - Relation between Continuity and Compact Sets
- Lecture 57 - Differentiability of Real Valued Functions
- Lecture 58 - Local Max. - Min. Cauchy's and Lagrange's Mean Value Theorem
- Lecture 59 - Rolle's Mean Value Theorems and Its Applications
- Lecture 60 - Tutorial-X
- Lecture 61
- Lecture 62
- Lecture 63
- Lecture 64
- Lecture 65
- Lecture 66
- Lecture 67
- Lecture 68

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

Lecture 69
Lecture 70
Lecture 71
Lecture 72
Lecture 73

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

NPTel Video Course - Mathematics - NOC:Modeling Transport Phenomena of Microparticles

Subject Co-ordinator - Dr. G.P. Raja Sekhar, Prof. Somnath Bhattacharyya

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Preliminary concepts
- Lecture 2 - Cauchy's equation of motion and Navier-Stokes equations
- Lecture 3 - Reduced forms of Navier-Stokes equations and Boundary conditions
- Lecture 4 - Exact solutions of Navier-Stokes equations in particular cases
- Lecture 5 - Dimensional Analysis - Non-dimensionalization of Navier-Stokes's equations
- Lecture 6 - Stream function formulation of Navier-Stokes equations
- Lecture 7 - Stokes flow past a cylinder
- Lecture 8 - Stokes flow past a sphere
- Lecture 9 - Elementary Lubrication Theory
- Lecture 10 - Hydrodynamics of Squeeze flow
- Lecture 11 - Solution of arbitrary Stokes flows
- Lecture 12 - Mechanics of Swimming Microorganisms
- Lecture 13 - Viscous flow past a spherical drop
- Lecture 14 - Migration of a viscous drop under Marangoni effects
- Lecture 15 - Singularities of Stokes flows
- Lecture 16 - Introduction to porous media
- Lecture 17 - Flow through porous media - elementary geometries
- Lecture 18 - Flow through composite porous channels
- Lecture 19 - Modeling transport of particles inside capillaries
- Lecture 20 - Modeling transport of microparticles - some applications
- Lecture 21 - Introduction to Electrokinetics
- Lecture 22 - Basics on Electrostatics
- Lecture 23 - Transport Equations for Electrokinetics, Part-I
- Lecture 24 - Transport Equations for Electrokinetics, Part-II
- Lecture 25 - Electric Double Layer
- Lecture 26 - Electroosmotic flow (EOF) of ionized fluid
- Lecture 27 - EOF in micro-channel
- Lecture 28 - Non-linear EOF, Overlapping Debye Layer
- Lecture 29 - Two-dimensional EOF

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTel and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - EOF near heterogeneous surface potential
- Lecture 31 - Electroosmosis in hydrophobic surface
- Lecture 32 - Numerical Methods for Boundary Value Problems (BVP)
- Lecture 33 - Numerical Methods for nonlinear BVP
- Lecture 34 - Numerical Methods for coupled set of BVP
- Lecture 35 - Numerical Methods for PDEs
- Lecture 36 - Numerical Methods for transport equations, Part-I
- Lecture 37 - Numerical Methods for transport equations, Part-II
- Lecture 38 - Electrophoresis of charged colloids, Part-I
- Lecture 39 - Electrophoresis of charged colloids, Part-II
- Lecture 40 - Gel Electrophoresis

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

NPTEL Video Course - Mathematics - NOC:Constrained and Unconstrained Optimization

Subject Co-ordinator - Dr. Debjani Chakraborty, Prof. A. Goswami

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction to Optimization
Lecture 2 - Assumptions and Mathematical Modeling of LPP
Lecture 3 - Geometrey of LPP
Lecture 4 - Graphical Solution of LPP - I
Lecture 5 - Graphical Solution of LPP - II
Lecture 6 - Solution of LPP
Lecture 7 - Simplex Method
Lecture 8 - Introduction to BIG-M Method
Lecture 9 - Algorithm of BIG-M Method
Lecture 10 - Problems on BIG-M Method
Lecture 11 - Two Phase Method
Lecture 12 - Two Phase Method
Lecture 13 - Special Cases of LPP
Lecture 14 - Degeneracy in LPP
Lecture 15 - Sensitivity Analysis - I
Lecture 16 - Sensitivity Analysis - II
Lecture 17 - Problems on Sensitivity Analysis
Lecture 18 - Introduction to Duality Theory - I
Lecture 19 - Introduction to Duality Theory - II
Lecture 20 - Dual Simplex Method
Lecture 21 - Examples on Dual Simplex Method
Lecture 22 - Interger Linear Programming
Lecture 23 - Interger Linear Programming
Lecture 24 - IPP
Lecture 25 - Mixed Integer Programming Problem
Lecture 26
Lecture 27
Lecture 28
Lecture 29

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30
- Lecture 31 - Introduction to Nonlinear programming
- Lecture 32 - Graphical Solution of NLP
- Lecture 33 - Types of NLP
- Lecture 34 - One dimensional unconstrained optimization
- Lecture 35 - Unconstrained Optimization
- Lecture 36 - Region Elimination Technique - 1
- Lecture 37 - Region Elimination Technique - 2
- Lecture 38 - Region Elimination Technique - 3
- Lecture 39 - Unconstrained Optimization
- Lecture 40 - Unconstrained Optimization
- Lecture 41 - Multivariate Unconstrained Optimization - 1
- Lecture 42 - Multivariate Unconstrained Optimization - 2
- Lecture 43 - Unconstrained Optimization
- Lecture 44 - NLP with Equality Constrained - 1
- Lecture 45 - NLP with Equality Constrained - 2
- Lecture 46 - Constrained NLP - 1
- Lecture 47 - Constrained NLP - 2
- Lecture 48 - Constrained Optimization
- Lecture 49 - Constrained Optimization
- Lecture 50 - KKT
- Lecture 51 - Constrained Optimization
- Lecture 52 - Constrained Optimization
- Lecture 53 - Feasible Direction
- Lecture 54 - Penalty and barrier method
- Lecture 55 - Penalty method
- Lecture 56 - Penalty and barrier method
- Lecture 57 - Penalty and barrier method
- Lecture 58 - Dynamic programming
- Lecture 59 - Multi-Objective decision making
- Lecture 60 - Multi-Attribute decision making

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

NPTEL Video Course - Mathematics - NOC:Matrix Solver

Subject Co-ordinator - Prof. Somnath Roy

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction to Matrix Algebra - I
- Lecture 2 - Introduction to Matrix Algebra - II
- Lecture 3 - System of Linear Equations
- Lecture 4 - Determinant of a Matrix
- Lecture 5 - Determinant of a Matrix (Continued...)
- Lecture 6 - Gauss Elimination
- Lecture 7 - Gauss Elimination (Continued...)
- Lecture 8 - LU Decomposition
- Lecture 9 - Gauss-Jordan Method
- Lecture 10 - Representation of Physical Systems as Matrix Equations
- Lecture 11 - Tridiagonal Matrix Algorithm
- Lecture 12 - Equations with Singular Matrices
- Lecture 13 - Introduction to Vector Space
- Lecture 14 - Vector Subspace
- Lecture 15 - Column Space and Nullspace of a Matrix
- Lecture 16 - Finding Null Space of a Matrix
- Lecture 17 - Solving $Ax=b$ when A is Singular
- Lecture 18 - Linear Independence and Spanning of a Subspace
- Lecture 19 - Basis and Dimension of a Vector Space
- Lecture 20 - Four Fundamental Subspaces of a Matrix
- Lecture 21 - Left and right inverse of a matrix
- Lecture 22 - Orthogonality between the subspaces
- Lecture 23 - Best estimate
- Lecture 24 - Projection operation and linear transformation
- Lecture 25 - Creating orthogonal basis vectors
- Lecture 26 - Gram-Schmidt and modified Gram-Schmidt algorithms
- Lecture 27 - Comparing GS and modified GS
- Lecture 28 - Introduction to eigenvalues and eigenvectors
- Lecture 29 - Eigenvalues and eigenvectors for real symmetric matrix

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Positive definiteness of a matrix
- Lecture 31 - Positive definiteness of a matrix (Continued...)
- Lecture 32 - Basic Iterative Methods
- Lecture 33 - Basic Iterative Methods
- Lecture 34 - Convergence Rate and Convergence Factor for Iterative Methods
- Lecture 35 - Numerical Experiments on Convergence
- Lecture 36 - Steepest Descent Method
- Lecture 37 - Steepest Descent Method
- Lecture 38 - Steepest Descent Method
- Lecture 39 - Introduction to General Projection Methods
- Lecture 40 - Residue Norm and Minimum Residual Algorithm
- Lecture 41 - Developing computer programs for basic iterative methods
- Lecture 42 - Developing computer programs for projection based methods
- Lecture 43 - Introduction to Krylov subspace methods
- Lecture 44 - Krylov subspace methods for linear systems
- Lecture 45 - Iterative methods for solving linear systems using Krylov subspace methods
- Lecture 46 - Conjugate gradient methods
- Lecture 47 - Conjugate gradient methods (Continued...)
- Lecture 48 - Conjugate gradient methods (Continued...) and Introduction to GMRES
- Lecture 49 - GMRES (Continued...)
- Lecture 50 - Lanczos Biorthogonalization and BCG Algorithm
- Lecture 51 - Numerical issues in BICG and polynomial based formulation
- Lecture 52 - Conjugate gradient squared and Biconjugate gradient stabilized
- Lecture 53 - Line relaxation method
- Lecture 54 - Block relaxation method
- Lecture 55 - Domain Decomposition and Parallel Computing
- Lecture 56 - Preconditioners
- Lecture 57 - Preconditioned conjugate gradient
- Lecture 58 - Preconditioned GMRES
- Lecture 59 - Multigrid methods - I
- Lecture 60 - Multigrid methods - II

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

NPTEL Video Course - Mathematics - NOC:Introduction to Abstract and Linear Algebra

Subject Co-ordinator - Prof.Sourav Mukhopadhyay

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Set Theory
Lecture 2 - Set Operations
Lecture 3 - Set Operations (Continued...)
Lecture 4 - Set of sets
Lecture 5 - Binary relation
Lecture 6 - Equivalence relation
Lecture 7 - Mapping
Lecture 8 - Permutation
Lecture 9 - Binary Composition
Lecture 10 - Groupoid
Lecture 11 - Group
Lecture 12 - Order of an element
Lecture 13 - Subgroup
Lecture 14 - Cyclic Group
Lecture 15 - Subgroup Operations
Lecture 16 - Left Cosets
Lecture 17 - Right Cosets
Lecture 18 - Normal Subgroup
Lecture 19 - Rings
Lecture 20 - Field
Lecture 21 - Vector Spaces
Lecture 22 - Sub-Spaces
Lecture 23 - Linear Span
Lecture 24 - Basis of a Vector Space
Lecture 25 - Dimension of a Vector space
Lecture 26 - Complement of subspace
Lecture 27 - Linear Transformation
Lecture 28 - Linear Transformation (Continued...)
Lecture 29 - More on linear mapping

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Linear Space
- Lecture 31 - Rank of a matrix
- Lecture 32 - Rank of a matrix (Continued...)
- Lecture 33 - System of linear equations
- Lecture 34 - Row rank and Column rank
- Lecture 35 - Eigen value of a matrix
- Lecture 36 - Eigen Vector
- Lecture 37 - Geometric multiplicity
- Lecture 38 - More on eigen value
- Lecture 39 - Similar matrices
- Lecture 40 - Diagonalisable

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

NPTEL Video Course - Mathematics - NOC:Engineering Mathematics-I

Subject Co-ordinator - Prof. Jitendra Kumar

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Rolle's Theorem
- Lecture 2 - Mean Value Theorems
- Lecture 3 - Indeterminate Forms - Part 1
- Lecture 4 - Indeterminate Forms - Part 2
- Lecture 5 - Taylor Polynomial and Taylor Series
- Lecture 6 - Limit of Functions of Two Variables
- Lecture 7 - Evaluation of Limit of Functions of Two Variables
- Lecture 8 - Continuity of Functions of Two Variables
- Lecture 9 - Partial Derivatives of Functions of Two Variables
- Lecture 10 - Partial Derivatives of Higher Order
- Lecture 11 - Derivative and Differentiability
- Lecture 12 - Differentiability of Functions of Two Variables
- Lecture 13 - Differentiability of Functions of Two Variables (Continued...)
- Lecture 14 - Differentiability of Functions of Two Variables (Continued...)
- Lecture 15 - Composite and Homogeneous Functions
- Lecture 16 - Taylor's Theorem for Functions of Two Variables
- Lecture 17 - Maxima and Minima of Functions of Two Variables
- Lecture 18 - Maxima and Minima of Functions of Two Variables (Continued...)
- Lecture 19 - Maxima and Minima of Functions of Two Variables (Continued...)
- Lecture 20 - Constrained Maxima and Minima
- Lecture 21 - Improper Integrals
- Lecture 22 - Improper Integrals (Continued...)
- Lecture 23 - Improper Integrals (Continued...)
- Lecture 24 - Improper Integrals (Continued...)
- Lecture 25 - Beta and Gamma Function
- Lecture 26 - Beta and Gamma Function (Continued...)
- Lecture 27 - Differentiation Under Integral Sign
- Lecture 28 - Double Integrals
- Lecture 29 - Double Integrals (Continued...)

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Double Integrals (Continued...)
- Lecture 31 - Integral Calculus Double Integrals in Polar Form
- Lecture 32 - Integral Calculus Double Integrals
- Lecture 33 - Integral Calculus Double Integrals
- Lecture 34 - Integral Calculus Triple Integrals
- Lecture 35 - Integral Calculus Triple Integrals (Continued...)
- Lecture 36 - System of Linear Equations
- Lecture 37 - System of Linear Equations Gauss Elimination
- Lecture 38 - System of Linear Equations Gauss Elimination (Continued...)
- Lecture 39 - Linear Algebra - Vector Spaces
- Lecture 40 - Linear Independence of Vectors
- Lecture 41 - Vector Spaces Spanning Set
- Lecture 42 - Vector Spaces Basis and Dimension
- Lecture 43 - Rank of a Matrix
- Lecture 44 - Linear Transformations
- Lecture 45 - Linear Transformations (Continued...)
- Lecture 46 - Eigenvalues and Eigenvectors
- Lecture 47 - Eigenvalues and Eigenvectors (Continued...)
- Lecture 48 - Eigenvalues and Eigenvectors (Continued...)
- Lecture 49 - Eigenvalues and Eigenvectors (Continued...)
- Lecture 50 - Eigenvalues and Eigenvectors
- Lecture 51 - Differential Equations - Introduction
- Lecture 52 - First Order Differential Equations
- Lecture 53 - Exact Differential Equations
- Lecture 54 - Exact Differential Equations (Continued...)
- Lecture 55 - First Order Linear Differential Equations
- Lecture 56 - Higher Order Linear Differential Equations
- Lecture 57 - Solution of Higher Order Homogeneous Linear Equations
- Lecture 58 - Solution of Higher Order Non-Homogeneous Linear Equations
- Lecture 59 - Solution of Higher Order Non-Homogeneous Linear Equations (Continued...)
- Lecture 60 - Cauchy-Euler Equations

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

NPTEL Video Course - Mathematics - NOC: Integral and Vector Calculus

Subject Co-ordinator - Prof. Hari Shankar Mahato

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Partition, Riemann integrability and One example
- Lecture 2 - Partition, Riemann integrability and One example (Continued...)
- Lecture 3 - Condition of integrability
- Lecture 4 - Theorems on Riemann integrations
- Lecture 5 - Examples
- Lecture 6 - Examples (Continued...)
- Lecture 7 - Reduction formula
- Lecture 8 - Reduction formula (Continued...)
- Lecture 9 - Improper Integral
- Lecture 10 - Improper Integral (Continued...)
- Lecture 11 - Improper Integral (Continued...)
- Lecture 12 - Improper Integral (Continued...)
- Lecture 13 - Introduction to Beta and Gamma Function
- Lecture 14 - Beta and Gamma Function
- Lecture 15 - Differentiation under Integral Sign
- Lecture 16 - Differentiation under Integral Sign (Continued...)
- Lecture 17 - Double Integral
- Lecture 18 - Double Integral over a Region E
- Lecture 19 - Examples of Integral over a Region E
- Lecture 20 - Change of variables in a Double Integral
- Lecture 21 - Change of order of Integration
- Lecture 22 - Triple Integral
- Lecture 23 - Triple Integral (Continued...)
- Lecture 24 - Area of Plane Region
- Lecture 25 - Area of Plane Region (Continued...)
- Lecture 26 - Rectification
- Lecture 27 - Rectification (Continued...)
- Lecture 28 - Surface Integral
- Lecture 29 - Surface Integral (Continued...)

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Surface Integral (Continued...)
- Lecture 31 - Volume Integral, Gauss Divergence Theorem
- Lecture 32 - Vector Calculus
- Lecture 33 - Limit, Continuity, Differentiability
- Lecture 34 - Successive Differentiation
- Lecture 35 - Integration of Vector Function
- Lecture 36 - Gradient of a Function
- Lecture 37 - Divergence and Curl
- Lecture 38 - Divergence and Curl Examples
- Lecture 39 - Divergence and Curl important Identities
- Lecture 40 - Level Surface Relevant Theorems
- Lecture 41 - Directional Derivative (Concept and Few Results)
- Lecture 42 - Directional Derivative (Concept and Few Results) (Continued...)
- Lecture 43 - Directional Derivatives, Level Surfaces
- Lecture 44 - Application to Mechanics
- Lecture 45 - Equation of Tangent, Unit Tangent Vector
- Lecture 46 - Unit Normal, Unit binormal, Equation of Normal Plane
- Lecture 47 - Introduction and Derivation of Serret-Frenet Formula, few results
- Lecture 48 - Example on binormal, normal tangent, Serret-Frenet Formula
- Lecture 49 - Osculating Plane, Rectifying plane, Normal plane
- Lecture 50 - Application to Mechanics, Velocity, speed, acceleration
- Lecture 51 - Angular Momentum, Newton's Law
- Lecture 52 - Example on derivation of equation of motion of particle
- Lecture 53 - Line Integral
- Lecture 54 - Surface integral
- Lecture 55 - Surface integral (Continued...)
- Lecture 56 - Green's Theorem and Example
- Lecture 57 - Volume integral, Gauss theorem
- Lecture 58 - Gauss divergence theorem
- Lecture 59 - Stoke's Theorem
- Lecture 60 - Overview of Course

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

NPTEL Video Course - Mathematics - NOC:Transform Calculus and its applications in Differential Equations

Subject Co-ordinator - Prof. A. Goswami

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction to Integral Transform and Laplace Transform

Lecture 2 - Existence of Laplace Transform

Lecture 3 - Shifting Properties of Laplace Transform

Lecture 4 - Laplace Transform of Derivatives and Integration of a Function - I

Lecture 5 - Laplace Transform of Derivatives and Integration of a Function - II

Lecture 6 - Explanation of properties of Laplace Transform using Examples

Lecture 7 - Laplace Transform of Periodic Function

Lecture 8 - Laplace Transform of some special Functions

Lecture 9 - Error Function, Dirac Delta Function and their Laplace Transform

Lecture 10 - Bessel Function and its Laplace Transform

Lecture 11 - Introduction to Inverse Laplace Transform

Lecture 12 - Properties of Inverse Laplace Transform

Lecture 13 - Convolution and its Applications

Lecture 14 - Evaluation of Integrals using Laplace Transform

Lecture 15 - Solution of Ordinary Differential Equations with constant coefficients using Laplace Transform

Lecture 16 - Solution of Ordinary Differential Equations with variable coefficients using Laplace Transform

Lecture 17 - Solution of Simultaneous Ordinary Differential Equations using Laplace Transform

Lecture 18 - Introduction to Integral Equation and its Solution Process

Lecture 19 - Introduction to Fourier Series

Lecture 20 - Fourier Series for Even and Odd Functions

Lecture 21 - Fourier Series of Functions having arbitrary period - I

Lecture 22 - Fourier Series of Functions having arbitrary period - II

Lecture 23 - Half Range Fourier Series

Lecture 24 - Parseval's Theorem and its Applications

Lecture 25 - Complex form of Fourier Series

Lecture 26 - Fourier Integral Representation

Lecture 27 - Introduction to Fourier Transform

Lecture 28 - Derivation of Fourier Cosine Transform and Fourier Sine Transform of Functions

Lecture 29 - Evaluation of Fourier Transform of various functions

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Linearity Property and Shifting Properties of Fourier Transform
- Lecture 31 - Change of Scale and Modulation Properties of Fourier Transform
- Lecture 32 - Fourier Transform of Derivative and Integral of a Function
- Lecture 33 - Applications of Properties of Fourier Transform - I
- Lecture 34 - Applications of Properties of Fourier Transform - II
- Lecture 35 - Fourier Transform of Convolution of two functions
- Lecture 36 - Parseval's Identity and its Application
- Lecture 37 - Evaluation of Definite Integrals using Properties of Fourier Transform
- Lecture 38 - Fourier Transform of Dirac Delta Function
- Lecture 39 - Representation of a function as Fourier Integral
- Lecture 40 - Applications of Fourier Transform to Ordinary Differential Equations - I
- Lecture 41 - Applications of Fourier Transform to Ordinary Differential Equations - II
- Lecture 42 - Solution of Integral Equations using Fourier Transform
- Lecture 43 - Introduction to Partial Differential Equations
- Lecture 44 - Solution of Partial Differential Equations using Laplace Transform
- Lecture 45 - Solution of Heat Equation and Wave Equation using Laplace Transform
- Lecture 46 - Criteria for choosing Fourier Transform, Fourier Sine Transform, Fourier Cosine Transform in solving PDEs
- Lecture 47 - Solution of Partial Differential Equations using Fourier Cosine Transform and Fourier Sine Transform
- Lecture 48 - Solution of Partial Differential Equations using Fourier Transform - I
- Lecture 49 - Solution of Partial Differential Equations using Fourier Transform - II
- Lecture 50 - Solving problems on Partial Differential Equations using Transform Techniques
- Lecture 51 - Introduction to Finite Fourier Transform
- Lecture 52 - Solution of Boundary Value Problems using Finite Fourier Transform - I
- Lecture 53 - Solution of Boundary Value Problems using Finite Fourier Transform - II
- Lecture 54 - Introduction to Mellin Transform
- Lecture 55 - Properties of Mellin Transform
- Lecture 56 - Examples of Mellin Transform - I
- Lecture 57 - Examples of Mellin Transform - II
- Lecture 58 - Introduction to Z-Transform
- Lecture 59 - Properties of Z-Transform
- Lecture 60 - Evaluation of Z-Transform of some functions

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

NPTEL Video Course - Mathematics - NOC:Statistical Inference (2019)

Subject Co-ordinator - Prof. Somesh Kumar

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction and Motivation - I
Lecture 2 - Introduction and Motivation - II
Lecture 3 - Basic Concepts of Point Estimations - I
Lecture 4 - Basic Concepts of Point Estimations - II
Lecture 5 - Basic Concepts of Point Estimations - III
Lecture 6 - Basic Concepts of Point Estimations - IV
Lecture 7 - Finding Estimators - I
Lecture 8 - Finding Estimators - II
Lecture 9 - Finding Estimators - III
Lecture 10 - Finding Estimators - IV
Lecture 11 - Finding Estimators - V
Lecture 12 - Finding Estimators - VI
Lecture 13 - Properties of MLEs - I
Lecture 14 - Properties of MLEs - II
Lecture 15 - Lower Bounds for Variance - I
Lecture 16 - Lower Bounds for Variance - II
Lecture 17 - Lower Bounds for Variance - III
Lecture 18 - Lower Bounds for Variance - IV
Lecture 19 - Lower Bounds for Variance - V
Lecture 20 - Lower Bounds for Variance - VI
Lecture 21 - Lower Bounds for Variance - VII
Lecture 22 - Lower Bounds for Variance - VIII
Lecture 23 - Sufficiency - I
Lecture 24 - Sufficiency - II
Lecture 25 - Sufficiency and Information - I
Lecture 26 - Sufficiency and Information - II
Lecture 27 - Minimal Sufficiency, Completeness - I
Lecture 28 - Minimal Sufficiency, Completeness - II
Lecture 29 - UMVU Estimation, Ancillarity - I

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - UMVU Estimation, Ancillarity - II
- Lecture 31 - Testing of Hypotheses
- Lecture 32 - Testing of Hypotheses
- Lecture 33 - Neyman Pearson Fundamental Lemma - I
- Lecture 34 - Neyman Pearson Fundamental Lemma - II
- Lecture 35 - Application of NP-Lemma - I
- Lecture 36 - Application of NP-Lemma - II
- Lecture 37 - UMP Tests - I
- Lecture 38 - UMP Tests - II
- Lecture 39 - UMP Tests - III
- Lecture 40 - UMP Tests - IV
- Lecture 41 - UMP Unbiased Tests - I
- Lecture 42 - UMP Unbiased Tests - II
- Lecture 43 - UMP Unbiased Tests - III
- Lecture 44 - UMP Unbiased Tests - IV
- Lecture 45 - Applications of UMP Unbiased Tests - I
- Lecture 46 - Applications of UMP Unbiased Tests - II
- Lecture 47 - Unbiased Test for Normal Populations - I
- Lecture 48 - Unbiased Test for Normal Populations - II
- Lecture 49 - Unbiased Test for Normal Populations - III
- Lecture 50 - Unbiased Test for Normal Populations - IV
- Lecture 51 - Likelihood Ratio Tests - I
- Lecture 52 - Likelihood Ratio Tests - II
- Lecture 53 - Likelihood Ratio Tests - III
- Lecture 54 - Likelihood Ratio Tests - IV
- Lecture 55 - Likelihood Ratio Tests - V
- Lecture 56 - Likelihood Ratio Tests - VI
- Lecture 57 - Likelihood Ratio Tests - VII
- Lecture 58 - Likelihood Ratio Tests - VIII
- Lecture 59 - Test for Goodness of Fit - I
- Lecture 60 - Test for Goodness of Fit - II
- Lecture 61 - Interval Estimation - I
- Lecture 62 - Interval Estimation - II
- Lecture 63 - Interval Estimation - III
- Lecture 64 - Interval Estimation - IV

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

NPTL Video Course - Mathematics - An Introduction to Riemann Surfaces and Algebraic Curves:
Complex 1-Tori and Elliptic Curves

Subject Co-ordinator - Dr. T.E. Venkata Balaji

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - The Idea of a Riemann Surface
- Lecture 2 - Simple Examples of Riemann Surfaces
- Lecture 3 - Maximal Atlases and Holomorphic Maps of Riemann Surfaces
- Lecture 4 - A Riemann Surface Structure on a Cylinder
- Lecture 5 - A Riemann Surface Structure on a Torus
- Lecture 6 - Riemann Surface Structures on Cylinders and Tori via Covering Spaces
- Lecture 7 - Moebius Transformations Make up Fundamental Groups of Riemann Surfaces
- Lecture 8 - Homotopy and the First Fundamental Group
- Lecture 9 - A First Classification of Riemann Surfaces
- Lecture 10 - The Importance of the Path-lifting Property
- Lecture 11 - Fundamental groups as Fibres of the Universal covering Space
- Lecture 12 - The Monodromy Action
- Lecture 13 - The Universal covering as a Hausdorff Topological Space
- Lecture 14 - The Construction of the Universal Covering Map
- Lecture 15 - Completion of the Construction of the Universal Covering
- Lecture 16 - Completion of the Construction of the Universal Covering
- Lecture 17 - The Riemann Surface Structure on the Topological Covering of a Riemann Surface
- Lecture 18 - Riemann Surfaces with Universal Covering the Plane or the Sphere
- Lecture 19 - Classifying Complex Cylinders
- Lecture 20 - Characterizing Moebius Transformations with a Single Fixed Point
- Lecture 21 - Characterizing Moebius Transformations with Two Fixed Points
- Lecture 22 - Torsion-freeness of the Fundamental Group of a Riemann Surface
- Lecture 23 - Characterizing Riemann Surface Structures on Quotients of the Upper Half-Plane with Abelian Fundamental Groups
- Lecture 24 - Classifying Annuli up to Holomorphic Isomorphism
- Lecture 25 - Orbits of the Integral Unimodular Group in the Upper Half-Plane
- Lecture 26 - Galois Coverings are precisely Quotients by Properly Discontinuous Free Actions
- Lecture 27 - Local Actions at the Region of Discontinuity of a Kleinian Subgroup of Moebius Transformations

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 28 - Quotients by Kleinian Subgroups give rise to Riemann Surfaces
- Lecture 29 - The Unimodular Group is Kleinian
- Lecture 30 - The Necessity of Elliptic Functions for the Classification of Complex Tori
- Lecture 31 - The Uniqueness Property of the Weierstrass Phe-function associated to a Lattice in the Plane
- Lecture 32 - The First Order Degree Two Cubic Ordinary Differential Equation satisfied by the Weierstrass Phe-function
- Lecture 33 - The Values of the Weierstrass Phe-function at the Zeros of its Derivative are nonvanishing Analytic Functions on the Upper Half-Plane
- Lecture 34 - The Construction of a Modular Form of Weight Two on the Upper Half-Plane
- Lecture 35 - The Fundamental Functional Equations satisfied by the Modular Form of Weight Two on the Upper Half-Plane
- Lecture 36 - The Weight Two Modular Form assumes Real Values on the Imaginary Axis in the Upper Half-plane
- Lecture 37 - The Weight Two Modular Form Vanishes at Infinity
- Lecture 38 - The Weight Two Modular Form Decays Exponentially in a Neighbourhood of Infinity
- Lecture 39 - A Suitable Restriction of the Weight Two Modular Form is a Holomorphic Conformal Isomorphism onto the Upper Half-Plane
- Lecture 40 - The J-Invariant of a Complex Torus (or) of an Algebraic Elliptic Curve
- Lecture 41 - A Fundamental Region in the Upper Half-Plane for the Elliptic Modular J-Invariant
- Lecture 42 - The Fundamental Region in the Upper Half-Plane for the Unimodular Group
- Lecture 43 - A Region in the Upper Half-Plane Meeting Each Unimodular Orbit Exactly Once
- Lecture 44 - Moduli of Elliptic Curves
- Lecture 45 - Punctured Complex Tori are Elliptic Algebraic Affine Plane Cubic Curves in Complex 2-Space
- Lecture 46 - The Natural Riemann Surface Structure on an Algebraic Affine Nonsingular Plane Curve
- Lecture 47 - Complex Projective 2-Space as a Compact Complex Manifold of Dimension Two
- Lecture 48 - Complex Tori are the same as Elliptic Algebraic Projective Curves

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

NPTEL Video Course - Mathematics - Linear Algebra

Subject Co-ordinator - Dr. K.C. Sivakumar

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to the Course Contents

Lecture 2 - Linear Equations

Lecture 3a - Equivalent Systems of Linear Equations I

Lecture 3b - Equivalent Systems of Linear Equations II

Lecture 4 - Row-reduced Echelon Matrices

Lecture 5 - Row-reduced Echelon Matrices and Non-homogeneous Equations

Lecture 6 - Elementary Matrices, Homogeneous Equations and Non-homogeneous Equations

Lecture 7 - Invertible matrices, Homogeneous Equations Non-homogeneous Equations

Lecture 8 - Vector spaces

Lecture 9 - Elementary Properties in Vector Spaces. Subspaces

Lecture 10 - Subspaces (Continued...), Spanning Sets, Linear Independence, Dependence

Lecture 11 - Basis for a vector space

Lecture 12 - Dimension of a vector space

Lecture 13 - Dimensions of Sums of Subspaces

Lecture 14 - Linear Transformations

Lecture 15 - The Null Space and the Range Space of a Linear Transformation

Lecture 16 - The Rank-Nullity-Dimension Theorem. Isomorphisms Between Vector Spaces

Lecture 17 - Isomorphic Vector Spaces, Equality of the Row-rank and the Column-rank - I

Lecture 18 - Equality of the Row-rank and the Column-rank - II

Lecture 19 - The Matrix of a Linear Transformation

Lecture 20 - Matrix for the Composition and the Inverse. Similarity Transformation

Lecture 21 - Linear Functionals. The Dual Space. Dual Basis - I

Lecture 22 - Dual Basis II. Subspace Annihilators - I

Lecture 23 - Subspace Annihilators - II

Lecture 24 - The Double Dual. The Double Annihilator

Lecture 25 - The Transpose of a Linear Transformation. Matrices of a Linear Transformation and its Transpose

Lecture 26 - Eigenvalues and Eigenvectors of Linear Operators

Lecture 27 - Diagonalization of Linear Operators. A Characterization

Lecture 28 - The Minimal Polynomial

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 29 - The Cayley-Hamilton Theorem
- Lecture 30 - Invariant Subspaces
- Lecture 31 - Triangulability, Diagonalization in Terms of the Minimal Polynomial
- Lecture 32 - Independent Subspaces and Projection Operators
- Lecture 33 - Direct Sum Decompositions and Projection Operators - I
- Lecture 34 - Direct Sum Decompositions and Projection Operators - II
- Lecture 35 - The Primary Decomposition Theorem and Jordan Decomposition
- Lecture 36 - Cyclic Subspaces and Annihilators
- Lecture 37 - The Cyclic Decomposition Theorem - I
- Lecture 38 - The Cyclic Decomposition Theorem - II. The Rational Form
- Lecture 39 - Inner Product Spaces
- Lecture 40 - Norms on Vector spaces. The Gram-Schmidt Procedure I
- Lecture 41 - The Gram-Schmidt Procedure II. The QR Decomposition
- Lecture 42 - Bessel's Inequality, Parseval's Identity, Best Approximation
- Lecture 43 - Best Approximation
- Lecture 44 - Orthogonal Complementary Subspaces, Orthogonal Projections
- Lecture 45 - Projection Theorem. Linear Functionals
- Lecture 46 - The Adjoint Operator
- Lecture 47 - Properties of the Adjoint Operation. Inner Product Space Isomorphism
- Lecture 48 - Unitary Operators
- Lecture 49 - Unitary operators - II. Self-Adjoint Operators - I.
- Lecture 50 - Self-Adjoint Operators - II - Spectral Theorem
- Lecture 51 - Normal Operators - Spectral Theorem

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

NPTEL Video Course - Mathematics - Mathematical Logic

Subject Co-ordinator - Prof. Arindama Singh

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Sets and Strings
Lecture 2 - Syntax of Propositional Logic
Lecture 3 - Unique Parsing
Lecture 4 - Semantics of PL
Lecture 5 - Consequences and Equivalences
Lecture 6 - Five results about PL
Lecture 7 - Calculations and Informal Proofs
Lecture 8 - More Informal Proofs
Lecture 9 - Normal forms
Lecture 10 - SAT and 3SAT
Lecture 11 - Horn-SAT and Resolution
Lecture 12 - Resolution
Lecture 13 - Adequacy of Resolution
Lecture 14 - Adequacy and Resolution Strategies
Lecture 15 - Propositional Calculus (PC)
Lecture 16 - Some Results about PC
Lecture 17 - Arguing with Proofs
Lecture 18 - Adequacy of PC
Lecture 19 - Compactness & Analytic Tableau
Lecture 20 - Examples of Tableau Proofs
Lecture 21 - Adequacy of Tableaux
Lecture 22 - Syntax of First order Logic (FL)
Lecture 23 - Symbolization & Scope of Quantifiers
Lecture 24 - Hurdles in giving Meaning
Lecture 25 - Semantics of FL
Lecture 26 - Relevance Lemma
Lecture 27 - Validity, Satisfiability & Equivalence
Lecture 28 - Six Results about FL
Lecture 29 - Laws, Calculation & Informal Proof

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Quantifier Laws and Consequences
- Lecture 31 - More Proofs and Prenex Form
- Lecture 32 - Prenex Form Conversion
- Lecture 33 - Skolem Form
- Lecture 34 - Syntactic Interpretation
- Lecture 35 - Herbrand's Theorem
- Lecture 36 - Most General Unifiers
- Lecture 37 - Resolution Rules
- Lecture 38 - Resolution Examples
- Lecture 39 - Axiomatic System FC
- Lecture 40 - FC and Semidecidability of FL
- Lecture 41 - Analytic Tableau for FL
- Lecture 42 - Godel's Incompleteness Theorems

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

NPTEL Video Course - Mathematics - Real Analysis

Subject Co-ordinator - Prof. S.H. Kulkarni

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction

Lecture 2 - Functions and Relations

Lecture 3 - Finite and Infinite Sets

Lecture 4 - Countable Sets

Lecture 5 - Uncountable Sets, Cardinal Number

Lecture 6 - Real Number System

Lecture 7 - LUB Axiom

Lecture 8 - Sequences of Real Numbers

Lecture 9 - Sequences of Real Numbers - (Continued.)

Lecture 10 - Sequences of Real Numbers - (Continued.)

Lecture 11 - Infinite Series of Real Numbers

Lecture 12 - Series of nonnegative Real Numbers

Lecture 13 - Conditional Convergence

Lecture 14 - Metric Spaces

Lecture 15 - Metric Spaces

Lecture 16 - Balls and Spheres

Lecture 17 - Open Sets

Lecture 18 - Closure Points, Limit Points and isolated Points

Lecture 19 - Closed sets

Lecture 20 - Sequences in Metric Spaces

Lecture 21 - Completeness

Lecture 22 - Baire Category Theorem

Lecture 23 - Limit and Continuity of a Function defined on a Metric space

Lecture 24 - Continuous Functions on a Metric Space

Lecture 25 - Uniform Continuity

Lecture 26 - Connectedness

Lecture 27 - Connected Sets

Lecture 28 - Compactness

Lecture 29 - Compactness (Continued.)

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Characterizations of Compact Sets
- Lecture 31 - Continuous Functions on Compact Sets
- Lecture 32 - Types of Discontinuity
- Lecture 33 - Differentiation
- Lecture 34 - Mean Value Theorems
- Lecture 35 - Mean Value Theorems (Continued.)
- Lecture 36 - Taylor's Theorem
- Lecture 37 - Differentiation of Vector Valued Functions
- Lecture 38 - Integration
- Lecture 39 - Integrability
- Lecture 40 - Integrable Functions
- Lecture 41 - Integrable Functions (Continued.)
- Lecture 42 - Integration as a Limit of Sum
- Lecture 43 - Integration and Differentiation
- Lecture 44 - Integration of Vector Valued Functions
- Lecture 45 - More Theorems on Integrals
- Lecture 46 - Sequences and Series of Functions
- Lecture 47 - Uniform Convergence
- Lecture 48 - Uniform Convergence and Integration
- Lecture 49 - Uniform Convergence and Differentiation
- Lecture 50 - Construction of Everywhere Continuous Nowhere Differentiable Function
- Lecture 51 - Approximation of a Continuous Function by Polynomials
- Lecture 52 - Equicontinuous family of Functions

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

NPTEL Video Course - Mathematics - Dynamic Data Assimilation: An Introduction

Subject Co-ordinator - Prof. S. Lakshmivarahan

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - An Overview
- Lecture 2 - Data Mining, Data assimilation and prediction
- Lecture 3 - A classification of forecast errors
- Lecture 4 - Finite Dimensional Vector Space
- Lecture 5 - Matrices
- Lecture 6 - Matrices (Continued...)
- Lecture 7 - Multi-variate Calculus
- Lecture 8 - Optimization in Finite Dimensional Vector spaces
- Lecture 9 - Deterministic, Static, linear Inverse (well-posed) Problems
- Lecture 10 - Deterministic, Static, Linear Inverse (Ill-posed) Problems
- Lecture 11 - A Geometric View \hat{A} Projections
- Lecture 12 - Deterministic, Static, nonlinear Inverse Problems
- Lecture 13 - On-line Least Squares
- Lecture 14 - Examples of static inverse problems
- Lecture 15 - Interlude and a Way Forward
- Lecture 16 - Matrix Decomposition Algorithms
- Lecture 17 - Matrix Decomposition Algorithms (Continued...)
- Lecture 18 - Minimization algorithms
- Lecture 19 - Minimization algorithms (Continued...)
- Lecture 20 - Inverse problems in deterministic
- Lecture 21 - Inverse problems in deterministic (Continued...)
- Lecture 22 - Forward sensitivity method
- Lecture 23 - Relation between FSM and 4DVAR
- Lecture 24 - Statistical Estimation
- Lecture 25 - Statistical Least Squares
- Lecture 26 - Maximum Likelihood Method
- Lecture 27 - Bayesian Estimation
- Lecture 28 - From Gauss to Kalman-Linear Minimum Variance Estimation
- Lecture 29 - Initialization Classical Method

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Optimal interpolations
- Lecture 31 - A Bayesian Formation-3D-VAR methods
- Lecture 32 - Linear Stochastic Dynamics - Kalman Filter
- Lecture 33 - Linear Stochastic Dynamics - Kalman Filter (Continued...)
- Lecture 34 - Linear Stochastic Dynamics - Kalman Filter (Continued...)
- Lecture 35 - Covariance Square Root Filter
- Lecture 36 - Nonlinear Filtering
- Lecture 37 - Ensemble Reduced Rank Filter
- Lecture 38 - Basic nudging methods
- Lecture 39 - Deterministic predictability
- Lecture 40 - Predictability A stochastic view and Summary

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

NPTEL Video Course - Mathematics - NOC:An Invitation to Mathematics

Subject Co-ordinator - Prof. Sankaran Vishwanath

Co-ordinating Institute - Institute of Mathematical Sciences

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

- Lecture 1 - Introduction
- Lecture 2 - Long division
- Lecture 3 - Applications of Long division
- Lecture 4 - Lagrange interpolation
- Lecture 5 - The 0-1 idea in other contexts - dot and cross product
- Lecture 6 - Taylors formula
- Lecture 7 - The Chebyshev polynomials
- Lecture 8 - Counting number of monomials - several variables
- Lecture 9 - Permutations, combinations and the binomial theorem
- Lecture 10 - Combinations with repetition, and counting monomials
- Lecture 11 - Combinations with restrictions, recurrence relations
- Lecture 12 - Fibonacci numbers; an identity and a bijective proof
- Lecture 13 - Permutations and cycle type
- Lecture 14 - The sign of a permutation, composition of permutations
- Lecture 15 - Rules for drawing tangle diagrams
- Lecture 16 - Signs and cycle decompositions
- Lecture 17 - Sorting lists of numbers, and crossings in tangle diagrams
- Lecture 18 - Real and integer valued polynomials
- Lecture 19 - Integer valued polynomials revisited
- Lecture 20 - Functions on the real line, continuity
- Lecture 21 - The intermediate value property
- Lecture 22 - Visualizing functions
- Lecture 23 - Functions on the plane, Rigid motions
- Lecture 24 - More examples of functions on the plane, dilations
- Lecture 25 - Composition of functions
- Lecture 26 - Affine and Linear transformations
- Lecture 27 - Length and Area dilation, the derivative
- Lecture 28 - Examples-I
- Lecture 29 - Examples-II

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Linear equations, Lagrange interpolation revisited
- Lecture 31 - Completed Matrices in combinatorics
- Lecture 32 - Polynomials acting on matrices
- Lecture 33 - Divisibility, prime numbers
- Lecture 34 - Congruences, Modular arithmetic
- Lecture 35 - The Chinese remainder theorem
- Lecture 36 - The Euclidean algorithm, the 0-1 idea and the Chinese remainder theorem

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

NPTEL Video Course - Mathematics - Advanced Complex Analysis

Subject Co-ordinator - Dr. T.E. Venkata Balaji

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Fundamental Theorems Connected with Zeros of Analytic Functions
- Lecture 2 - The Argument (Counting) Principle, Rouché's Theorem and The Fundamental Theorem of Algebra
- Lecture 3 - Morera's Theorem and Normal Limits of Analytic Functions
- Lecture 4 - Hurwitz's Theorem and Normal Limits of Univalent Functions
- Lecture 5 - Local Constancy of Multiplicities of Assumed Values
- Lecture 6 - The Open Mapping Theorem
- Lecture 7 - Introduction to the Inverse Function Theorem
- Lecture 8 - Completion of the Proof of the Inverse Function Theorem
- Lecture 9 - Univalent Analytic Functions have never-zero Derivatives and are Analytic Isomorphisms
- Lecture 10 - Introduction to the Implicit Function Theorem
- Lecture 11 - Proof of the Implicit Function Theorem
- Lecture 12 - Proof of the Implicit Function Theorem
- Lecture 13 - Doing Complex Analysis on a Real Surface
- Lecture 14 - $F(z,w)=0$ is naturally a Riemann Surface
- Lecture 15 - Constructing the Riemann Surface for the Complex Logarithm
- Lecture 16 - Constructing the Riemann Surface for the m -th root function
- Lecture 17 - The Riemann Surface for the functional inverse of an analytic mapping at a critical point
- Lecture 18 - The Algebraic nature of the functional inverses of an analytic mapping at a critical point
- Lecture 19 - The Idea of a Direct Analytic Continuation or an Analytic Extension
- Lecture 20 - General or Indirect Analytic Continuation and the Lipschitz Nature of the Radius of Convergence
- Lecture 21 - Analytic Continuation Along Paths via Power Series Part A
- Lecture 22 - Analytic Continuation Along Paths via Power Series Part B
- Lecture 23 - Continuity of Coefficients occurring in Families of Power Series defining Analytic Continuations
- Lecture 24 - Analytic Continuability along Paths
- Lecture 25 - Maximal Domains of Direct and Indirect Analytic Continuation
- Lecture 26 - Deducing the Second (Simply Connected) Version of the Monodromy Theorem from the First (Homotopy)
- Lecture 27 - Existence and Uniqueness of Analytic Continuations on Nearby Paths
- Lecture 28 - Proof of the First (Homotopy) Version of the Monodromy Theorem
- Lecture 29 - Proof of the Algebraic Nature of Analytic Branches of the Functional Inverse of an Analytic Function

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - The Mean-Value Property, Harmonic Functions and the Maximum Principle
- Lecture 31 - Proofs of Maximum Principles and Introduction to Schwarz Lemma
- Lecture 32 - Proof of Schwarz Lemma and Uniqueness of Riemann Mappings
- Lecture 33 - Reducing Existence of Riemann Mappings to Hyperbolic Geometry of Sub-domains of the Unit Disc
- Lecture 34 - Differential or Infinitesimal Schwarz Lemma, Picks Lemma, Hyperbolic Arclengths, Metric and Geodesics
- Lecture 35 - Differential or Infinitesimal Schwarz Lemma, Picks Lemma, Hyperbolic Arclengths, Metric and Geodesics
- Lecture 36 - Hyperbolic Geodesics for the Hyperbolic Metric on the Unit Disc
- Lecture 37 - Schwarz-Pick Lemma for the Hyperbolic Metric on the Unit Disc
- Lecture 38 - Arzela-Ascoli Theorem
- Lecture 39 - Completion of the Proof of the Arzela-Ascoli Theorem and Introduction to Montels Theorem
- Lecture 40 - The Proof of Montels Theorem
- Lecture 41 - The Candidate for a Riemann Mapping
- Lecture 42 - Completion of Proof of The Riemann Mapping Theorem
- Lecture 43 - Completion of Proof of The Riemann Mapping Theorem

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

NPTEL Video Course - Mathematics - NOC:Discrete Mathematics

Subject Co-ordinator - Prof. Sourav Chakraborty

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Course Introduction
- Lecture 2 - Sets, Relations and Functions
- Lecture 3 - Propositional Logic and Predicate Logic
- Lecture 4 - Propositional Logic and Predicate Logic (Part 2)
- Lecture 5 - Elementary Number Theory
- Lecture 6 - Formal Proofs
- Lecture 7 - Direct Proofs
- Lecture 8 - Case Study
- Lecture 9 - Case Study (Part 2)
- Lecture 10 - Sets, Relations, Function and Logic
- Lecture 11 - Proof by Contradiction (Part 1)
- Lecture 12 - Proof by Contradiction (Part 2)
- Lecture 13 - Proof by Contraposition
- Lecture 14 - Proof by Counter Example
- Lecture 15 - Mathematical Induction (Part 1)
- Lecture 16 - Mathematical Induction (Part 2)
- Lecture 17 - Mathematical Induction (Part 3)
- Lecture 18 - Mathematical Induction (Part 4)
- Lecture 19 - Mathematical Induction (Part 5)
- Lecture 20 - Mathematical Induction (Part 6)
- Lecture 21 - Mathematical Induction (Part 7)
- Lecture 22 - Mathematical Induction (Part 8)
- Lecture 23 - Introduction to Graph Theory
- Lecture 24 - Handshake Problem
- Lecture 25 - Tournament Problem
- Lecture 26 - Tournament Problem (Part 2)
- Lecture 27 - Ramsey Problem
- Lecture 28 - Ramsey Problem (Part 2)
- Lecture 29 - Properties of Graphs

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Problem 1
- Lecture 31 - Problem 2
- Lecture 32 - Problem 3 & 4
- Lecture 33 - Counting for Selection
- Lecture 34 - Counting for Distribution
- Lecture 35 - Counting for Distribution (Part 2)
- Lecture 36 - Some Counting Problems
- Lecture 37 - Counting using Recurrence Relations
- Lecture 38 - Counting using Recurrence Relations (Part 2)
- Lecture 39 - Solving Recurrence Relations (Part 1)
- Lecture 40 - Solving Recurrence Relations (Part 2)
- Lecture 41 - Asymptotic Relations (Part 1)
- Lecture 42 - Asymptotic Relations (Part 2)
- Lecture 43 - Asymptotic Relations (Part 3)
- Lecture 44 - Asymptotic Relations (Part 4)
- Lecture 45 - Generating Functions (Part 1)
- Lecture 46 - Generating Functions (Part 2)
- Lecture 47 - Generating Functions (Part 3)
- Lecture 48 - Generating Functions (Part 4)
- Lecture 49 - Proof Techniques
- Lecture 50 - Modeling
- Lecture 51 - Combinatorics

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

NPTEL Video Course - Mathematics - Advanced Complex Analysis - Part 2

Subject Co-ordinator - Dr. T.E. Venkata Balaji

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Properties of the Image of an Analytic Function - Introduction to the Picard Theorems
- Lecture 2 - Recalling Singularities of Analytic Functions - Non-isolated and Isolated Removable, Pole and Essential
- Lecture 3 - Recalling Riemann's Theorem on Removable Singularities
- Lecture 4 - Casorati-Weierstrass Theorem; Dealing with the Point at Infinity -- Riemann Sphere and Riemann Sphere
- Lecture 5 - Neighborhood of Infinity, Limit at Infinity and Infinity as an Isolated Singularity
- Lecture 6 - Studying Infinity - Formulating Epsilon-Delta Definitions for Infinite Limits and Limits at Infinity
- Lecture 7 - When is a function analytic at infinity ?
- Lecture 8 - Laurent Expansion at Infinity and Riemann's Removable Singularities Theorem for the Point at Infinity
- Lecture 9 - The Generalized Liouville Theorem - Little Brother of Little Picard and Analogue of Casorati-Weierstrass
- Lecture 10 - Morera's Theorem at Infinity, Infinity as a Pole and Behaviour at Infinity of Rational and Meromorphic
- Lecture 11 - Residue at Infinity and Introduction to the Residue Theorem for the Extended Complex Plane - Residue
- Lecture 12 - Proofs of Two Avatars of the Residue Theorem for the Extended Complex Plane and Applications of
- Lecture 13 - Infinity as an Essential Singularity and Transcendental Entire Functions
- Lecture 14 - Meromorphic Functions on the Extended Complex Plane are Precisely Quotients of Polynomials
- Lecture 15 - The Ubiquity of Meromorphic Functions - The Nerves of the Geometric Network Bridging Algebra, Analysis
- Lecture 16 - Continuity of Meromorphic Functions at Poles and Topologies of Spaces of Functions
- Lecture 17 - Why Normal Convergence, but Not Globally Uniform Convergence, is the Inevitable in Complex Analysis
- Lecture 18 - Measuring Distances to Infinity, the Function Infinity and Normal Convergence of Holomorphic Functions
- Lecture 19 - The Invariance Under Inversion of the Spherical Metric on the Extended Complex Plane
- Lecture 20 - Introduction to Hurwitz's Theorem for Normal Convergence of Holomorphic Functions in the Spherical
- Lecture 21 - Completion of Proof of Hurwitz's Theorem for Normal Limits of Analytic Functions in the Spherical
- Lecture 22 - Hurwitz's Theorem for Normal Limits of Meromorphic Functions in the Spherical Metric
- Lecture 23 - What could the Derivative of a Meromorphic Function Relative to the Spherical Metric Possibly Be
- Lecture 24 - Defining the Spherical Derivative of a Meromorphic Function
- Lecture 25 - Well-definedness of the Spherical Derivative of a Meromorphic Function at a Pole and Inversion-in
- Lecture 26 - Topological Preliminaries - Translating Compactness into Boundedness
- Lecture 27 - Introduction to the Arzela-Ascoli Theorem - Passing from abstract Compactness to verifiable Equi
- Lecture 28 - Proof of the Arzela-Ascoli Theorem for Functions - Abstract Compactness Implies Equicontinuity
- Lecture 29 - Proof of the Arzela-Ascoli Theorem for Functions - Equicontinuity Implies Compactness

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Introduction to the Montel Theorem - the Holomorphic Avatar of the Arzela-Ascoli Theorem & Why
- Lecture 31 - Completion of Proof of the Montel Theorem - the Holomorphic Avatar of the Arzela-Ascoli Theorem
- Lecture 32 - Introduction to Marty's Theorem - the Meromorphic Avatar of the Montel & Arzela-Ascoli Theorems
- Lecture 33 - Proof of one direction of Marty's Theorem - the Meromorphic Avatar of the Montel & Arzela-Ascoli
- Lecture 34 - Proof of the other direction of Marty's Theorem - the Meromorphic Avatar of the Montel & Arzela
- Lecture 35 - Normal Convergence at Infinity and Hurwitz's Theorems for Normal Limits of Analytic and Meromorphic
- Lecture 36 - Normal Sequential Compactness, Normal Uniform Boundedness and Montel's & Marty's Theorems at Infinity
- Lecture 37 - Local Analysis of Normality and the Zooming Process - Motivation for Zalcman's Lemma
- Lecture 38 - Characterizing Normality at a Point by the Zooming Process and the Motivation for Zalcman's Lemma
- Lecture 39 - Local Analysis of Normality and the Zooming Process - Motivation for Zalcman's Lemma
- Lecture 40 - Montel's Deep Theorem - The Fundamental Criterion for Normality or Fundamental Normality Test
- Lecture 41 - Proofs of the Great and Little Picard Theorems
- Lecture 42 - Royden's Theorem on Normality Based On Growth Of Derivatives
- Lecture 43 - Schottky's Theorem - Uniform Boundedness from a Point to a Neighbourhood & Problem Solving Sessions

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

NPTEL Video Course - Mathematics - Basic Algebraic Geometry : Varieties, Morphisms, Local Rings, Function Fields

Subject Co-ordinator - Dr. T.E. Venkata Balaji

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - What is Algebraic Geometry?
- Lecture 2 - The Zariski Topology and Affine Space
- Lecture 3 - Going back and forth between subsets and ideals
- Lecture 4 - Irreducibility in the Zariski Topology
- Lecture 5 - Irreducible Closed Subsets Correspond to Ideals Whose Radicals are Prime
- Lecture 6 - Understanding the Zariski Topology on the Affine Line; The Noetherian property in Topology and in Algebra
- Lecture 7 - Basic Algebraic Geometry
- Lecture 8 - Topological Dimension, Krull Dimension and Heights of Prime Ideals
- Lecture 9 - The Ring of Polynomial Functions on an Affine Variety
- Lecture 10 - Geometric Hypersurfaces are Precisely Algebraic Hypersurfaces
- Lecture 11 - Why Should We Study Affine Coordinate Rings of Functions on Affine Varieties ?
- Lecture 12 - Capturing an Affine Variety Topologically From the Maximal Spectrum of its Ring of Functions
- Lecture 13 - Analyzing Open Sets and Basic Open Sets for the Zariski Topology
- Lecture 14 - The Ring of Functions on a Basic Open Set in the Zariski Topology
- Lecture 15 - Quasi-Compactness in the Zariski Topology; Regularity of a Function at a point of an Affine Variety
- Lecture 16 - What is a Global Regular Function on a Quasi-Affine Variety?
- Lecture 17 - Characterizing Affine Varieties; Defining Morphisms between Affine or Quasi-Affine Varieties
- Lecture 18 - Translating Morphisms into Affines as k -Algebra maps and the Grand Hilbert Nullstellensatz
- Lecture 19 - Morphisms into an Affine Correspond to k -Algebra Homomorphisms from its Coordinate Ring of Functions
- Lecture 20 - The Coordinate Ring of an Affine Variety Determines the Affine Variety and is Intrinsic to it
- Lecture 21 - Automorphisms of Affine Spaces and of Polynomial Rings - The Jacobian Conjecture; The Punctured Affine Line
- Lecture 22 - The Various Avatars of Projective n -space
- Lecture 23 - Gluing $(n+1)$ copies of Affine n -Space to Produce Projective n -space in Topology, Manifold Theory and Algebra
- Lecture 24 - Translating Projective Geometry into Graded Rings and Homogeneous Ideals
- Lecture 25 - Expanding the Category of Varieties to Include Projective and Quasi-Projective Varieties
- Lecture 26 - Translating Homogeneous Localisation into Geometry and Back
- Lecture 27 - Adding a Variable is Undone by Homogenous Localization - What is the Geometric Significance of this?
- Lecture 28 - Doing Calculus Without Limits in Geometry ?
- Lecture 29 - The Birth of Local Rings in Geometry and in Algebra

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - The Formula for the Local Ring at a Point of a Projective Variety Or Playing with Localisations
- Lecture 31 - The Field of Rational Functions or Function Field of a Variety - The Local Ring at the Generic Point
- Lecture 32 - Fields of Rational Functions or Function Fields of Affine and Projective Varieties and their Relationship
- Lecture 33 - Global Regular Functions on Projective Varieties are Simply the Constants
- Lecture 34 - The d-Uple Embedding and the Non-Intrinsic Nature of the Homogeneous Coordinate Ring of a Projective Variety
- Lecture 35 - The Importance of Local Rings - A Morphism is an Isomorphism if it is a Homeomorphism and Induces an Isomorphism of Local Rings
- Lecture 36 - The Importance of Local Rings - A Rational Function in Every Local Ring is Globally Regular
- Lecture 37 - Geometric Meaning of Isomorphism of Local Rings - Local Rings are Almost Global
- Lecture 38 - Local Ring Isomorphism, Equals Function Field Isomorphism, Equals Birationality
- Lecture 39 - Why Local Rings Provide Calculus Without Limits for Algebraic Geometry Pun Intended!
- Lecture 40 - How Local Rings Detect Smoothness or Nonsingularity in Algebraic Geometry
- Lecture 41 - Any Variety is a Smooth Manifold with or without Non-Smooth Boundary
- Lecture 42 - Any Variety is a Smooth Hypersurface On an Open Dense Subset

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

NPTEL Video Course - Mathematics - NOC:Introduction to Commutative Algebra

Subject Co-ordinator - Prof. A.V.Jayanthan

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Review of Ring Theory
- Lecture 2 - Review of Ring Theory (Continued...)
- Lecture 3 - Ideals in commutative rings
- Lecture 4 - Operations on ideals
- Lecture 5 - Properties of prime ideals
- Lecture 6 - Colon and Radical of ideals
- Lecture 7 - Radicals, extension and contraction of ideals
- Lecture 8 - Modules and homomorphisms
- Lecture 9 - Isomorphism theorems and Operations on modules
- Lecture 10 - Operations on modules (Continued...)
- Lecture 11 - Module homomorphism and determinant trick
- Lecture 12 - Nakayama's lemma and exact sequences
- Lecture 13 - Exact sequences (Continued...)
- Lecture 14 - Homomorphisms and Tensor products
- Lecture 15 - Properties of tensor products
- Lecture 16 - Properties of tensor products (Continued...)
- Lecture 17 - Tensor product of Algebras
- Lecture 18 - Localization
- Lecture 19 - Localization (Continued...)
- Lecture 20 - Local properties
- Lecture 21 - Further properties of localization
- Lecture 22 - Integral dependence
- Lecture 23 - Integral extensions
- Lecture 24 - Lying over and Going-up theorems
- Lecture 25 - Going-down theorem
- Lecture 26 - Going-down theorem (Continued...)
- Lecture 27 - Chain conditions
- Lecture 28 - Noetherian and Artinian modules
- Lecture 29 - Properties of Noetherian and Artinian modules, Composition Series

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Further properties of Noetherian and Artinian modules and rings
- Lecture 31 - Hilbert basis theorem and Primary decomposition
- Lecture 32 - Primary decomposition (Continued...)
- Lecture 33 - Uniqueness of primary decomposition
- Lecture 34 - 2nd Uniqueness theorem, Artinian rings
- Lecture 35 - Properties of Artinian rings
- Lecture 36 - Structure Theorem of Artinian rings
- Lecture 37 - Noether Normalization
- Lecture 38 - Hilberts Nullstellensatz

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

NPTEL Video Course - Mathematics - NOC:Differential Equations

Subject Co-ordinator - Prof. Srinivasa Manam

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction to Ordinary Differential Equations (ODE)
- Lecture 2 - Methods for First Order ODE's - Homogeneous Equations
- Lecture 3 - Methods for First order ODE's - Exact Equations
- Lecture 4 - Methods for First Order ODE's - Exact Equations (Continued...)
- Lecture 5 - Methods for First order ODE's - Reducible to Exact Equations
- Lecture 6 - Methods for First order ODE's - Reducible to Exact Equations (Continued...)
- Lecture 7 - Non-Exact Equations - Finding Integrating Factors
- Lecture 8 - Linear First Order ODE and Bernoulli's Equation
- Lecture 9 - Introduction to Second order ODE's
- Lecture 10 - Properties of solutions of second order homogeneous ODE's
- Lecture 11 - Abel's formula to find the other solution
- Lecture 12 - Abel's formula - Demonstration
- Lecture 13 - Second Order ODE's with constant coefficients
- Lecture 14 - Euler - Cauchy equation
- Lecture 15 - Non homogeneous ODEs Variation of Parameters
- Lecture 16 - Method of undetermined coefficients
- Lecture 17 - Demonstration of Method of undetermined coefficients
- Lecture 18 - Power Series and its properties
- Lecture 19 - Power Series Solutions to Second Order ODE's
- Lecture 20 - Power Series Solutions (Continued...)
- Lecture 21 - Legendre Differential Equation
- Lecture 22 - Legendre Polynomials
- Lecture 23 - Properties of Legendre Polynomials
- Lecture 24 - Power series solutions around a regular singular point
- Lecture 25 - Frobenius method of solutions
- Lecture 26 - Frobenius method of solutions (Continued...)
- Lecture 27 - Examples on Frobenius method
- Lecture 28 - Bessel differential equation
- Lecture 29 - Frobenius solutions for Bessel Equation

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Properties of Bessel functions
- Lecture 31 - Properties of Bessel functions (Continued...)
- Lecture 32 - Introduction to Sturm-Liouville theory
- Lecture 33 - Sturm-Liouville Problems
- Lecture 34 - Regular Sturm-Liouville problem
- Lecture 35 - Periodic and singular Sturm-Liouville Problems
- Lecture 36 - Generalized Fourier series
- Lecture 37 - Examples of Sturm-Liouville systems
- Lecture 38 - Examples of Sturm-Liouville systems (Continued...)
- Lecture 39 - Examples of regular Sturm-Liouville systems
- Lecture 40 - Second order linear PDEs
- Lecture 41 - Classification of second order linear PDEs
- Lecture 42 - Reduction to canonical form for equations with constant coefficients
- Lecture 43 - Reduction to canonical form for equations with variable coefficients
- Lecture 44 - Reduction to Normal form-More examples
- Lecture 45 - D'Alembert solution for wave equation
- Lecture 46 - Uniqueness of solutions for wave equation
- Lecture 47 - Vibration of a semi-infinite string
- Lecture 48 - Vibration of a finite string
- Lecture 49 - Finite length string vibrations
- Lecture 50 - Finite length string vibrations (Continued...)
- Lecture 51 - Non-homogeneous wave equation
- Lecture 52 - Vibration of a circular drum
- Lecture 53 - Solutions of heat equation-Properties
- Lecture 54 - Temperature in an infinite rod
- Lecture 55 - Temperature in a semi-infinite rod
- Lecture 56 - Non-homogeneous heat equation
- Lecture 57 - Temperature in a finite rod
- Lecture 58 - Temperature in a finite rod with insulated ends
- Lecture 59 - Laplace equation over a rectangle
- Lecture 60 - Laplace equation over a rectangle with flux boundary conditions
- Lecture 61 - Laplace equation over circular domains
- Lecture 62 - Laplace equation over circular Sectors
- Lecture 63 - Uniqueness of the boundary value problems for Laplace equation
- Lecture 64 - Conclusions

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

NPTEL Video Course - Mathematics - NOC:Numerical Analysis

Subject Co-ordinator - Prof. R. Usha

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Lesson 1 - Introduction, Motivation
- Lecture 2 - Lesson 2 - Part 1 - Mathematical Preliminaries, Polynomial Interpolation - 1
- Lecture 3 - Lesson 2 - Part 2 - Mathematical Preliminaries, Polynomial Interpolation - 1
- Lecture 4 - Lesson 3 - Part 1 - Polynomial Interpolation - 2
- Lecture 5 - Lesson 3 - Part 2 - Polynomial Interpolation - 2
- Lecture 6 - Lesson 4 - Polynomial Interpolation - 3
- Lecture 7 - Lagrange Interpolation Polynomial, Error In Interpolation - 1
- Lecture 8 - Lagrange Interpolation Polynomial, Error In Interpolation - 1
- Lecture 9 - Error In Interpolation - 2
- Lecture 10 - Error In Interpolation - 2
- Lecture 11 - Divide Difference Interpolation Polynomial
- Lecture 12 - Properties Of Divided Difference, Introduction To Inverse Interpolation
- Lecture 13 - Properties Of Divided Difference, Introduction To Inverse Interpolation
- Lecture 14 - Inverse Interpolation, Remarks on Polynomial Interpolation
- Lecture 15 - Numerical Differentiation - 1 Taylor Series Method
- Lecture 16 - Numerical Differentiation - 2 Method Of Undetermined Coefficients
- Lecture 17 - Numerical Differentiation - 2 Polynomial Interpolation Method
- Lecture 18 - Numerical Differentiation - 3 Operator Method Numerical Integration - 1
- Lecture 19 - Numerical Integration - 2 Error in Trapezoidal Rule Simpson's Rule
- Lecture 20 - Numerical Integration - 3 Error in Simpson's Rule Composite in Trapezoidal Rule, Error
- Lecture 21 - Numerical Integration - 4 Composite Simpsons Rule , Error Method of Undetermined Coefficients
- Lecture 22 - Numerical Integration - 5 Gaussian Quadrature (Two-Point Method)
- Lecture 23 - Numerical Integrature - 5 Gaussian Quadrature (Three-Point Method) Adaptive Quadrature
- Lecture 24 - Numerical Solution of Ordinary Differential Equation (ODE) - 1
- Lecture 25 - Numerical Solution Of ODE-2 Stability , Single-Step Methods - 1 Taylor Series Method
- Lecture 26 - Numerical Solution Of ODE-3 Examples of Taylor Series Method Euler's Method
- Lecture 27 - Numerical Solution Of ODE-4 Runge-Kutta Methods
- Lecture 28 - Numerical Solution Of ODE-5 Example For RK-Method Of Order 2 Modified Euler's Method
- Lecture 29 - Numerical Solution Of Ordinary Differential Equations - 6 Predictor-Corrector Methods (Adam-Moulton)

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Numerical Solution Of Ordinary Differential Equations - 7
- Lecture 31 - Numerical Solution Of Ordinary Differential Equations - 8
- Lecture 32 - Numerical Solution of Ordinary Differential Equations - 9
- Lecture 33 - Numerical Solution of Ordinary Differential Equations - 10
- Lecture 34 - Numerical Solution of Ordinary Differential Equations - 11
- Lecture 35 - Root Finding Methods - 1 The Bisection Method - 1
- Lecture 36 - Root Finding Methods - 2 The Bisection Method - 2
- Lecture 37 - Root Finding Methods - 3 Newton-Raphson Method - 1
- Lecture 38 - Root Finding Methods - 4 Newton-Raphson Method - 2
- Lecture 39 - Root Finding Methods - 5 Secant Method, Method Of false Position
- Lecture 40 - Root Finding Methods - 6 Fixed Point Methods - 1
- Lecture 41 - Root Finding Methods - 7 Fixed Point Methods - 2
- Lecture 42 - Root Finding Methods - 8 Fixed Point Iteration Methods - 3
- Lecture 43 - Root Finding Methods - 9 Practice Problems
- Lecture 44 - Solution Of Linear Systems Of Equations - 1
- Lecture 45 - Solution Of Linear Systems Of Equations - 2
- Lecture 46 - Solution Of Linear Systems Of Equations - 3
- Lecture 47 - Solution Of Linear Systems Of Equations - 4
- Lecture 48 - Solution Of Linear Systems Of Equations - 5
- Lecture 49 - Solution Of Linear Systems Of Equations - 6
- Lecture 50 - Solution Of Linear Systems Of Equations - 7
- Lecture 51 - Solution Of Linear Systems Of Equations - 8 Iterative Method - 1
- Lecture 52 - Solution Of Linear Systems Of Equations - 8 Iterative Method - 2
- Lecture 53 - Matrix Eigenvalue Problems - 2 Power Method - 2
- Lecture 54 - Practice Problems

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

NPTEL Video Course - Mathematics - NOC:Graph Theory

Subject Co-ordinator - Dr. Soumen Maity

Co-ordinating Institute - IISER - Pune

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

Lecture 1 - Basic Concepts
Lecture 2 - Basic Concepts - 1
Lecture 3 - Eulerian and Hamiltonian Graph
Lecture 4 - Eulerian and Hamiltonian Graph - 1
Lecture 5 - Bipartite Graph
Lecture 6 - Bipartite Graph
Lecture 7 - Diameter of a graph; Isomorphic graphs
Lecture 8 - Diameter of a graph; Isomorphic graphs
Lecture 9 - Minimum Spanning Tree
Lecture 10 - Minimum Spanning Trees (Continued...)
Lecture 11 - Minimum Spanning Trees (Continued...)
Lecture 12 - Minimum Spanning Trees (Continued...)
Lecture 13 - Maximum Matching in Bipartite Graph
Lecture 14 - Maximum Matching in Bipartite Graph - 1
Lecture 15 - Hall's Theorem and Konig's Theorem
Lecture 16 - Hall's Theorem and Konig's Theorem - 1
Lecture 17 - Independent Set and Edge Cover
Lecture 18 - Independent Set and Edge Cover - 1
Lecture 19 - Matching in General Graphs
Lecture 20 - Proof of Halls Theorem
Lecture 21 - Stable Matching
Lecture 22 - Gale-Shapley Algorithm
Lecture 23 - Graph Connectivity
Lecture 24 - Graph Connectivity - 1
Lecture 25 - 2-Connected Graphs
Lecture 26 - 2-Connected Graphs - 1
Lecture 27 - Subdivision of an edge; 2-edge-connected graphs
Lecture 28 - Problems Related to Graphs Connectivity
Lecture 29 - Flow Network

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Residual Network and Augmenting Path
- Lecture 31 - Augmenting Path Algorithm
- Lecture 32 - Max-Flow and Min-Cut
- Lecture 33 - Max-Flow and Min-Cut Theorem
- Lecture 34 - Vertex Colouring
- Lecture 35 - Chromatic Number and Max. Degree
- Lecture 36 - Edge Colouring
- Lecture 37 - Planar Graphs and Euler's Formula
- Lecture 38 - Characterization Of Planar Graphs
- Lecture 39 - Colouring of Planar Graphs

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

NPTEL Video Course - Mathematics - NOC:Transform Techniques for Engineers

Subject Co-ordinator - Prof. Srinivasa Manam

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to Fourier series

Lecture 2 - Fourier series - Examples

Lecture 3 - Complex Fourier series

Lecture 4 - Conditions for the Convergence of Fourier Series

Lecture 5 - Conditions for the Convergence of Fourier Series (Continued...)

Lecture 6 - Use of Delta function in the Fourier series convergence

Lecture 7 - More Examples on Fourier Series of a Periodic Signal

Lecture 8 - Gibb's Phenomenon in the Computation of Fourier Series

Lecture 9 - Properties of Fourier Transform of a Periodic Signal

Lecture 10 - Properties of Fourier transform (Continued...)

Lecture 11 - Parseval's Identity and Recap of Fourier series

Lecture 12 - Fourier integral theorem-an informal proof

Lecture 13 - Definition of Fourier transforms

Lecture 14 - Fourier transform of a Heavyside function

Lecture 15 - Use of Fourier transforms to evaluate some integrals

Lecture 16 - Evaluation of an integral- Recall of complex function theory

Lecture 17 - Properties of Fourier transforms of non-periodic signals

Lecture 18 - More properties of Fourier transforms

Lecture 19 - Fourier integral theorem - proof

Lecture 20 - Application of Fourier transform to ODE's

Lecture 21 - Application of Fourier transforms to differential and integral equations

Lecture 22 - Evaluation of integrals by Fourier transforms

Lecture 23 - D'Alembert's solution by Fourier transform

Lecture 24 - Solution of Heat equation by Fourier transform

Lecture 25 - Solution of Heat and Laplace equations by Fourier transform

Lecture 26 - Introduction to Laplace transform

Lecture 27 - Laplace transform of elementary functions

Lecture 28 - Properties of Laplace transforms

Lecture 29 - Properties of Laplace transforms (Continued...)

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Methods of finding inverse Laplace transform
- Lecture 31 - Heavyside expansion theorem
- Lecture 32 - Review of complex function theory
- Lecture 33 - Inverse Laplace transform by contour integration
- Lecture 34 - Application of Laplace transforms - ODEs'
- Lecture 35 - Solutions of initial or boundary value problems for ODEs'
- Lecture 36 - Solving first order PDE's by Laplace transform
- Lecture 37 - Solution of wave equation by Laplace transform
- Lecture 38 - Solving hyperbolic equations by Laplace transform
- Lecture 39 - Solving heat equation by Laplace transform
- Lecture 40 - Initial boundary value problems for heat equations
- Lecture 41 - Solution of Integral Equations by Laplace Transform
- Lecture 42 - Evaluation of Integrals by Laplace Transform
- Lecture 43 - Introduction to Z-Transforms
- Lecture 44 - Properties of Z-Transforms
- Lecture 45 - Inverse Z-transforms
- Lecture 46 - Solution of difference equations by Z-transforms
- Lecture 47 - Evaluation of infinite sums by Z-transforms
- Lecture 48 - conclusions

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

NPTEL Video Course - Mathematics - NOC:Introduction to Probability and Statistics

Subject Co-ordinator - Prof. G. Srinivasan

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction to probability and Statistics
- Lecture 2 - Types of data
- Lecture 3 - Categorical data
- Lecture 4 - Describing Categorical data
- Lecture 5 - Describing Categorical data (Continued...)
- Lecture 6 - Describing numerical data
- Lecture 7 - Describing numerical data (Continued...)
- Lecture 8 - Exercises, Association between categorical variables
- Lecture 9 - Association between categorical variables (Continued...)
- Lecture 10 - Association between numerical variables
- Lecture 11 - Association between numerical variables (Continued...)
- Lecture 12 - Probability
- Lecture 13 - Rules of Probability
- Lecture 14 - Rules of Probability (Continued...)
- Lecture 15 - Conditional Probability
- Lecture 16 - Random variables
- Lecture 17 - Random variables - concepts and exercises
- Lecture 18 - Association between Random variables
- Lecture 19 - Binomial Distribution
- Lecture 20 - Normal distribution
- Lecture 21 - Additional Examples

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

NPTEL Video Course - Mathematics - NOC:Introduction to Abstract Group Theory

Subject Co-ordinator - Prof. Krishna Hanumanthu

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Motivational examples of groups
- Lecture 2 - Definition of a group and examples
- Lecture 3 - More examples of groups
- Lecture 4 - Basic properties of groups and multiplication tables
- Lecture 5 - Problems - 1
- Lecture 6 - Problems - 2
- Lecture 7 - Problems - 3
- Lecture 8 - Subgroups
- Lecture 9 - Types of groups
- Lecture 10 - Group homomorphisms and examples
- Lecture 11 - Properties of homomorphisms
- Lecture 12 - Group isomorphisms
- Lecture 13 - Normal subgroups
- Lecture 14 - Equivalence relations
- Lecture 15 - Problems - 4
- Lecture 16 - Cosets and Lagrange's theorem
- Lecture 17 - S_3 revisited
- Lecture 18 - Problems - 5
- Lecture 19 - Quotient groups
- Lecture 20 - Examples of quotient groups
- Lecture 21 - First isomorphism theorem
- Lecture 22 - Examples and Second isomorphism theorem
- Lecture 23 - Third isomorphism theorem
- Lecture 24 - Cauchy's theorem
- Lecture 25 - Problems - 6
- Lecture 26 - Symmetric groups - I
- Lecture 27 - Symmetric Groups - II
- Lecture 28 - Symmetric groups - III
- Lecture 29 - Symmetric groups - IV

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Odd and even permutations - I
- Lecture 31 - Odd and even permutations - II
- Lecture 32 - Alternating groups
- Lecture 33 - Group actions
- Lecture 34 - Examples of group actions
- Lecture 35 - Orbits and stabilizers
- Lecture 36 - Counting formula
- Lecture 37 - Cayley's theorem
- Lecture 38 - Problems - 7
- Lecture 39 - Problems - 8 and Class equation
- Lecture 40 - Group actions on subsets
- Lecture 41 - Sylow Theorem - I
- Lecture 42 - Sylow Theorem - II
- Lecture 43 - Sylow Theorem - III
- Lecture 44 - Problems - 9
- Lecture 45 - Problems - 10

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

NPTEL Video Course - Mathematics - NOC:Groups: Motion, Symmetry and Puzzles

Subject Co-ordinator - Prof. Amit Kulshrestha

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Permutation, symmetry and groups
- Lecture 2 - Groups acting on a set/an object
- Lecture 3 - More on group actions
- Lecture 4 - Groups and parity
- Lecture 5 - Parity and puzzles
- Lecture 6 - Generators and relations
- Lecture 7 - Cosets, quotients and homomorphisms
- Lecture 8 - Cayley graphs of groups
- Lecture 9 - Platonic solids
- Lecture 10 - Symmetries of plane and wallpapers
- Lecture 11 - Introduction to GAP
- Lecture 12 - GAP through Rubik's cube
- Lecture 13 - Representing abstract groups
- Lecture 14 - A quick introduction to group representations
- Lecture 15 - Rotations and quaternions
- Lecture 16 - Rotational symmetries of platonic solids
- Lecture 17 - Finite subgroups of $SO(3)$

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

NPTEL Video Course - Mathematics - Discrete Mathematics

Subject Co-ordinator - Dr. Aditi Gangopadhyay, Dr. Sugata Gangopadhyay, Dr. Tanuja Srivastava

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Introduction to the theory of sets
- Lecture 2 - Set operation and laws of set operation
- Lecture 3 - The principle of inclusion and exclusion
- Lecture 4 - Application of the principle of inclusion and exclusion
- Lecture 5 - Fundamentals of logic
- Lecture 6 - Logical Inferences
- Lecture 7 - Methods of proof of an implication
- Lecture 8 - First order logic (1)
- Lecture 9 - First order logic (2)
- Lecture 10 - Rules of inference for quantified propositions
- Lecture 11 - Mathematical Induction (1)
- Lecture 12 - Mathematical Induction (2)
- Lecture 13 - Sample space, events
- Lecture 14 - Probability, conditional probability
- Lecture 15 - Independent events, Bayes theorem
- Lecture 16 - Information and mutual information
- Lecture 17 - Basic definition
- Lecture 18 - Isomorphism and sub graphs
- Lecture 19 - Walks, paths and circuits operations on graphs
- Lecture 20 - Euler graphs, Hamiltonian circuits
- Lecture 21 - Shortest path problem
- Lecture 22 - Planar graphs
- Lecture 23 - Basic definition
- Lecture 24 - Properties of relations
- Lecture 25 - Graph of relations
- Lecture 26 - Matrix of relation
- Lecture 27 - Closure of relation (1)
- Lecture 28 - Closure of relation (2)
- Lecture 29 - Warshall's algorithm

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Partially ordered relation
- Lecture 31 - Partially ordered sets
- Lecture 32 - Lattices
- Lecture 33 - Boolean algebra
- Lecture 34 - Boolean function (1)
- Lecture 35 - Boolean function (2)
- Lecture 36 - Discrete numeric function
- Lecture 37 - Generating function
- Lecture 38 - Introduction to recurrence relations
- Lecture 39 - Second order recurrence relation with constant coefficients (1)
- Lecture 40 - Second order recurrence relation with constant coefficients (2)
- Lecture 41 - Application of recurrence relation

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

NPTEL Video Course - Mathematics - NOC:Mathematical Methods and its Applications

Subject Co-ordinator - Prof. P.N. Agarwal, S. K. Gupta

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Introduction to linear differential equations
- Lecture 2 - Linear dependence, independence and Wronskian of functions
- Lecture 3 - Solution of second-order homogenous linear differential equations with constant coefficients - I
- Lecture 4 - Solution of second-order homogenous linear differential equations with constant coefficients - II
- Lecture 5 - Method of undetermined coefficients
- Lecture 6 - Methods for finding Particular Integral for second-order linear differential equations with constant coefficients
- Lecture 7 - Methods for finding Particular Integral for second-order linear differential equations with constant coefficients
- Lecture 8 - Methods for finding Particular Integral for second-order linear differential equations with constant coefficients
- Lecture 9 - Euler-Cauchy equations
- Lecture 10 - Method of reduction for second-order linear differential equations
- Lecture 11 - Method of variation of parameters
- Lecture 12 - Solution of second order differential equations by changing dependent variable
- Lecture 13 - Solution of second order differential equations by changing independent variable
- Lecture 14 - Solution of higher-order homogenous linear differential equations with constant coefficients
- Lecture 15 - Methods for finding Particular Integral for higher-order linear differential equations
- Lecture 16 - Formulation of Partial differential equations
- Lecture 17 - Solution of Lagrange's equation - I
- Lecture 18 - Solution of Lagrange's equation - II
- Lecture 19 - Solution of first order nonlinear equations - I
- Lecture 20 - Solution of first order nonlinear equations - II
- Lecture 21 - Solution of first order nonlinear equations - III
- Lecture 22 - Solution of first order nonlinear equations - IV
- Lecture 23 - Introduction to Laplace transforms
- Lecture 24 - Laplace transforms of some standard functions
- Lecture 25 - Existence theorem for Laplace transforms
- Lecture 26 - Properties of Laplace transforms - I
- Lecture 27 - Properties of Laplace transforms - II
- Lecture 28 - Properties of Laplace transforms - III
- Lecture 29 - Properties of Laplace transforms - IV

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Convolution theorem for Laplace transforms - I
- Lecture 31 - Convolution theorem for Laplace transforms - II
- Lecture 32 - Initial and final value theorems for Laplace transforms
- Lecture 33 - Laplace transforms of periodic functions
- Lecture 34 - Laplace transforms of Heaviside unit step function
- Lecture 35 - Laplace transforms of Dirac delta function
- Lecture 36 - Applications of Laplace transforms - I
- Lecture 37 - Applications of Laplace transforms - II
- Lecture 38 - Applications of Laplace transforms - III
- Lecture 39 - Z⁻¹ transform and inverse Z-transform of elementary functions
- Lecture 40 - Properties of Z-transforms - I
- Lecture 41 - Properties of Z-transforms - II
- Lecture 42 - Initial and final value theorem for Z-transforms
- Lecture 43 - Convolution theorem for Z-transforms
- Lecture 44 - Applications of Z-transforms - I
- Lecture 45 - Applications of Z-transforms - II
- Lecture 46 - Applications of Z-transforms - III
- Lecture 47 - Fourier series and its convergence - I
- Lecture 48 - Fourier series and its convergence - II
- Lecture 49 - Fourier series of even and odd functions
- Lecture 50 - Fourier half-range series
- Lecture 51 - Parseval's Identity
- Lecture 52 - Complex form of Fourier series
- Lecture 53 - Fourier integrals
- Lecture 54 - Fourier sine and cosine integrals
- Lecture 55 - Fourier transforms
- Lecture 56 - Fourier sine and cosine transforms
- Lecture 57 - Convolution theorem for Fourier transforms
- Lecture 58 - Applications of Fourier transforms to BVP - I
- Lecture 59 - Applications of Fourier transforms to BVP - II
- Lecture 60 - Applications of Fourier transforms to BVP - III

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

NPTEL Video Course - Mathematics - NOC: Integral Equations, Calculus of Variations and its Applications

Subject Co-ordinator - Prof.D. N Pandey, Prof. P.N. Agarwal

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Definition and classification of linear integral equations
- Lecture 2 - Conversion of IVP into integral equations
- Lecture 3 - Conversion of BVP into an integral equations
- Lecture 4 - Conversion of integral equations into differential equations
- Lecture 5 - Integro-differential equations
- Lecture 6 - Fredholm integral equation with separable kernel
- Lecture 7 - Fredholm integral equation with separable kernel
- Lecture 8 - Solution of integral equations by successive substitutions
- Lecture 9 - Solution of integral equations by successive approximations
- Lecture 10 - Solution of integral equations by successive approximations
- Lecture 11 - Fredholm integral equations with symmetric kernels
- Lecture 12 - Fredholm integral equations with symmetric kernels
- Lecture 13 - Fredholm integral equations with symmetric kernels
- Lecture 14 - Construction of Green function - I
- Lecture 15 - Construction of Green function - II
- Lecture 16 - Green function for self adjoint linear differential equations
- Lecture 17 - Green function for non-homogeneous boundary value problem
- Lecture 18 - Fredholm alternative theorem - I
- Lecture 19 - Fredholm alternative theorem - II
- Lecture 20 - Fredholm method of solutions
- Lecture 21 - Classical Fredholm theory
- Lecture 22 - Classical Fredholm theory
- Lecture 23 - Classical Fredholm theory
- Lecture 24 - Method of successive approximations
- Lecture 25 - Neumann series and resolvent kernels - I
- Lecture 26 - Neumann series and resolvent kernels - II
- Lecture 27 - Equations with convolution type kernels - I
- Lecture 28 - Equations with convolution type kernels - II
- Lecture 29 - Singular integral equations - I

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Singular integral equations - II
- Lecture 31 - Cauchy type integral equations - I
- Lecture 32 - Cauchy type integral equations - II
- Lecture 33 - Cauchy type integral equations - III
- Lecture 34 - Cauchy type integral equations - IV
- Lecture 35 - Cauchy type integral equations - V
- Lecture 36 - Solution of integral equations using Fourier transform
- Lecture 37 - Solution of integral equations using Hilbert transform - I
- Lecture 38 - Solution of integral equations using Hilbert transform - II
- Lecture 39 - Calculus of variations
- Lecture 40 - Calculus of variations
- Lecture 41 - Calculus of variations
- Lecture 42 - Calculus of variations
- Lecture 43 - Euler equation
- Lecture 44 - Euler equation
- Lecture 45 - Brachistochrone problem and Euler equation - I
- Lecture 46 - Euler's equation - II
- Lecture 47 - Functions of several independent variables
- Lecture 48 - Variational problems in parametric form
- Lecture 49 - Variational problems of general type
- Lecture 50 - Variational derivative and invariance of Euler's equation
- Lecture 51 - Invariance of Euler's equation and isoperimetric problem - I
- Lecture 52 - Isoperimetric problem - II
- Lecture 53 - Variational problem involving a conditional extremum - I
- Lecture 54 - Variational problem involving a conditional extremum - II
- Lecture 55 - Variational problems with moving boundaries - I
- Lecture 56 - Variational problems with moving boundaries - II
- Lecture 57 - Variational problems with moving boundaries - III
- Lecture 58 - Variational problems with moving boundaries; One sided variation
- Lecture 59 - Variational problem with a movable boundary for a functional dependent on two functions
- Lecture 60 - Hamilton's principle

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

NPTEL Video Course - Mathematics - NOC:Nonlinear Programming

Subject Co-ordinator - S. K. Gupta

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Convex Sets and Functions

Lecture 2 - Properties of Convex Functions - I

Lecture 3 - Properties of Convex Functions - II

Lecture 4 - Properties of Convex Functions- III

Lecture 5 - Convex Programming Problems

Lecture 6 - KKT optimality conditions

Lecture 7 - Quadratic Programming Problems - I

Lecture 8 - Quadratic Programming Problems - II

Lecture 9 - Separable Programming - I

Lecture 10 - Separable Programming - II

Lecture 11 - Geometric Programming - I

Lecture 12 - Geometric Programming - II

Lecture 13 - Geometric Programming - III

Lecture 14 - Dynamic Programming - I

Lecture 15 - Dynamic Programming - II

Lecture 16 - Dynamic programming approach to find shortest path in any network

Lecture 17 - Dynamic Programming - IV

Lecture 18 - Search Techniques - I

Lecture 19 - Search Techniques - II

Lecture 20 - Search Techniques - III

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

NPTEL Video Course - Mathematics - NOC:Numerical Methods

Subject Co-ordinator - Prof. Sanjeev Kumar, Prof. Ameeya Kumar Nayak

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Introduction to error analysis and linear systems
- Lecture 2 - Gaussian elimination with Partial pivoting
- Lecture 3 - LU decomposition
- Lecture 4 - Jacobi and Gauss Seidel methods
- Lecture 5 - Iterative methods-II
- Lecture 6 - Introduction to Non-linear equations and Bisection method
- Lecture 7 - Regula Falsi and Secant methods
- Lecture 8 - Newton-Raphson method
- Lecture 9 - Fixed point iteration method
- Lecture 10 - System of Nonlinear equations
- Lecture 11 - Introduction to Eigenvalues and Eigenvectors
- Lecture 12 - Similarity Transformations and Gershgorin Theorem
- Lecture 13 - Jacobi's Method for Computing Eigenvalues
- Lecture 14 - Power Method
- Lecture 15 - Inverse Power Method
- Lecture 16 - Interpolation - Part I (Introduction to Interpolation)
- Lecture 17 - Interpolation - Part II (Some basic operators and their properties)
- Lecture 18 - Interpolation - Part III (Newton's Forward/ Backward difference and derivation of general error formula)
- Lecture 19 - Interpolation - Part IV (Error in approximating a function by a polynomial using Newton's Forward difference formula)
- Lecture 20 - Interpolation - Part V (Solving problems using Newton's Forward and Backward difference formula)
- Lecture 21 - Interpolation - Part VI (Central difference formula)
- Lecture 22 - Interpolation - Part VII (Lagrange interpolation formula with examples)
- Lecture 23 - Interpolation - Part VIII (Divided difference interpolation with examples)
- Lecture 24 - Interpolation - Part IX (Hermite's interpolation with examples)
- Lecture 25 - Numerical differentiation - Part I (Introduction to numerical differentiation by interpolation formula)
- Lecture 26 - Numerical differentiation - Part II (Numerical differentiation based on Lagrange's interpolation formula)
- Lecture 27 - Numerical differentiation - Part III (Numerical differentiation based on Divided difference formula)
- Lecture 28 - Numerical differentiation - Part IV (Maxima and minima of a tabulated function and differentiation of a function)
- Lecture 29 - Numerical differentiation - Part V (Differentiation based on finite difference operators)

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Numerical differentiation - Part VI (Method of undetermined coefficients and Derivatives with un
- Lecture 31 - Numerical Integration - Part I (Methodology of Numerical Integration and Rectangular rule)
- Lecture 32 - Numerical Integration - Part II (Quadrature formula and Trapezoidal rule with associated errors)
- Lecture 33 - Numerical Integration - Part III (Simpsons 1/3rd rule with associated errors)
- Lecture 34 - Numerical Integration - Part IV (Composite Simpsons 1/3rd rule and Simpsons 3/8th rule with exam
- Lecture 35 - Numerical Integration - Part V (Gauss Legendre 2-point and 3-point formula with examples)
- Lecture 36 - Introduction to Ordinary Differential equations
- Lecture 37 - Numerical methods for ODE-1
- Lecture 38 - Numerical Methods - II
- Lecture 39 - R-K Methods for solving ODEs
- Lecture 40 - Multi-step Method for solving ODEs

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

NPTEL Video Course - Mathematics - NOC:Numerical Linear Algebra

Subject Co-ordinator - Prof.D. N Pandey, Prof. P.N. Agrawal

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Matrix Operations and Types of Matrices
Lecture 2 - Determinant of a Matrix
Lecture 3 - Rank of a Matrix
Lecture 4 - Vector Space - I
Lecture 5 - Vector Space - II
Lecture 6 - Linear dependence and independence
Lecture 7 - Bases and Dimension - I
Lecture 8 - Bases and Dimension - II
Lecture 9 - Linear Transformation - I
Lecture 10 - Linear Transformation - II
Lecture 11 - Orthogonal Subspaces
Lecture 12 - Row Space, Column Space and Null Space
Lecture 13 - Eigen Values and Eigen Vectors - I
Lecture 14 - Eigen Values and Eigen Vectors - II
Lecture 15 - Diagonalizable Matrices
Lecture 16 - Orthogonal Sets
Lecture 17 - Gram Schmidt orthogonalization and orthogonal bases
Lecture 18 - Introduction to Matlab
Lecture 19 - Sign Integer Representation
Lecture 20 - Computer Representation of Numbers
Lecture 21 - Floating Point Representation
Lecture 22 - Round-off Error
Lecture 23 - Error Propagation in Computer Arithmetic
Lecture 24 - Addition and Multiplication of Floating Point Numbers
Lecture 25 - Conditioning and Condition Numbers - I
Lecture 26 - Conditioning and Condition Numbers - II
Lecture 27 - Stability of Numerical Algorithms - I
Lecture 28 - Stability of Numerical Algorithms - II
Lecture 29 - Vector Norms - I

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Vector Norms - II
- Lecture 31 - Matrix Norms - I
- Lecture 32 - Matrix Norms - II
- Lecture 33 - Convergent Matrices - I
- Lecture 34 - Convergent Matrices - II
- Lecture 35 - Stability of non linear system
- Lecture 36 - Condition number of a matrix
- Lecture 37 - Sensitivity Analysis - I
- Lecture 38 - Sensitivity Analysis - II
- Lecture 39 - Residual Theorem
- Lecture 40 - Nearness to Singularity
- Lecture 41 - Estimation of the Condition Number
- Lecture 42 - Singular value decomposition of a matrix - I
- Lecture 43 - Singular value decomposition of a matrix - II
- Lecture 44 - Orthonormal Projections
- Lecture 45 - Algebraic and geometric properties of SVD
- Lecture 46 - SVD and their applications
- Lecture 47 - Perturbation theorem for singular values
- Lecture 48 - Outer product expansion of a matrix
- Lecture 49 - Least square solutions - I
- Lecture 50 - Least square solutions - II
- Lecture 51 - Householder matrices
- Lecture 52 - Householder matrices and their applications
- Lecture 53 - Householder QR factorization - I
- Lecture 54 - Householder QR factorization - II
- Lecture 55 - Basic theorems on eigenvalues and QR method
- Lecture 56 - Power Method
- Lecture 57 - Rate of Convergence of Power Method
- Lecture 58 - Applications of Power Method with Shift
- Lecture 59 - Jacobi Method - I
- Lecture 60 - Jacobi Method - II

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

NPTEL Video Course - Mathematics - NOC:Numerical Methods - Finite Difference Approach

Subject Co-ordinator - Prof. Ameeya Kumar Nayak

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Introduction to Numerical solutions

Lecture 2 - Numerical Solution of ODE

Lecture 3 - Numerical solution of PDE

Lecture 4 - Finite difference approximation

Lecture 5 - Polynomial fitting and one-sided approximation

Lecture 6 - Solution of parabolic equation

Lecture 7 - Implicit and C-N scheme for solving 1D parabolic equation

Lecture 8 - Stability analysis of Explicit scheme for solving parabolic equation

Lecture 9 - Stability of Crank-Nicolson's scheme

Lecture 10 - Approximation of derivative boundary conditions

Lecture 11 - Solution of two-dimensional parabolic equation

Lecture 12 - Solution of 2D parabolic equation using ADI scheme

Lecture 13 - Solution of Elliptic Equation

Lecture 14 - Solution of Elliptic equation using SOR method

Lecture 15 - Solution of Elliptic equation using ADI scheme

Lecture 16 - Solution of Hyperbolic equation

Lecture 17 - Stability analysis for Hyperbolic equations

Lecture 18 - Characteristics of PDE

Lecture 19 - Lax-Wendroff's method

Lecture 20 - Wendroff's method

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

NPTEL Video Course - Mathematics - NOC:Multivariable Calculus

Subject Co-ordinator - Dr. Sanjeev Kumar, S. K. Gupta

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Functions of several variables
Lecture 2 - Limits for multivariable functions - I
Lecture 3 - Limits for multivariable functions - II
Lecture 4 - Continuity of multivariable functions
Lecture 5 - Partial Derivatives - I
Lecture 6 - Partial Derivatives - II
Lecture 7 - Differentiability - I
Lecture 8 - Differentiability - II
Lecture 9 - Chain rule - I
Lecture 10 - Chain rule - II
Lecture 11 - Change of variables
Lecture 12 - Euler's theorem for homogeneous functions
Lecture 13 - Tangent planes and Normal lines
Lecture 14 - Extreme values - I
Lecture 15 - Extreme values - II
Lecture 16 - Lagrange multipliers
Lecture 17 - Taylor's theorem
Lecture 18 - Error approximation
Lecture 19 - Polar-curves
Lecture 20 - Multiple Integrals
Lecture 21 - Change Of Order Of Integration
Lecture 22 - Change of Variables in Multiple Integral
Lecture 23 - Introduction to Gamma Function
Lecture 24 - Introduction to Beta Function
Lecture 25 - Properties of Beta and Gamma Functions - I
Lecture 26 - Properties of Beta and Gamma Functions - II
Lecture 27 - Dirichlet's Integral
Lecture 28 - Applications of Multiple Integrals
Lecture 29 - Vector Differentiation

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Gradient of a Scalar Field and Directional Derivative
- Lecture 31 - Normal Vector and Potential field
- Lecture 32 - Gradient (Identities), Divergence and Curl (Identities)
- Lecture 33 - Some Identities on Divergence and Curl
- Lecture 34 - Line Integral (I)
- Lecture 35 - Applications of Line Integrals
- Lecture 36 - Green's Theorem
- Lecture 37 - Surface Area
- Lecture 38 - Surface Integral
- Lecture 39 - Divergence Theorem of Gauss
- Lecture 40 - Stoke's Theorem

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

NPTEL Video Course - Mathematics - NOC:Ordinary and Partial Differential Equations and Applications

Subject Co-ordinator - Prof.D. N Pandey, Prof. P.N. Agrawal

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Introduction to differential equations - I
- Lecture 2 - Introduction to differential equations - II
- Lecture 3 - Existence and uniqueness of solutions of differential equations - I
- Lecture 4 - Existence and uniqueness of solutions of differential equations - II
- Lecture 5 - Existence and uniqueness of solutions of differential equations - III
- Lecture 6 - Existence and uniqueness of solutions of a system of differential equations
- Lecture 7 - Linear System
- Lecture 8 - Properties of Homogeneous Systems
- Lecture 9 - Solution of Homogeneous Linear System with Constant Coefficients - I
- Lecture 10 - Solution of Homogeneous Linear System with Constant Coefficients - II
- Lecture 11 - Solution of Homogeneous Linear System with Constant Coefficients - III
- Lecture 12 - Solution of Non-Homogeneous Linear System with Constant Coefficients
- Lecture 13 - Power Series
- Lecture 14 - Uniform Convergence of Power Series
- Lecture 15 - Power Series Solution of Second Order Homogeneous Equations
- Lecture 16 - Regular singular points - I
- Lecture 17 - Regular singular points - II
- Lecture 18 - Regular singular points - III
- Lecture 19 - Regular singular points - IV
- Lecture 20 - Regular singular points - V
- Lecture 21 - Critical points
- Lecture 22 - Stability of Linear Systems - I
- Lecture 23 - Stability of Linear Systems - II
- Lecture 24 - Stability of Linear Systems - III
- Lecture 25 - Critical Points and Paths of Non-linear Systems
- Lecture 26 - Boundary value problems for second order differential equations
- Lecture 27 - Self - adjoint Forms
- Lecture 28 - Sturm - Liouville problem and its properties
- Lecture 29 - Sturm - Liouville problem and its applications

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Green's function and its applications - I
- Lecture 31 - Green's function and its applications - II
- Lecture 32 - Origins and Classification of First Order PDE
- Lecture 33 - Initial Value Problem for Quasi-linear First Order Equations
- Lecture 34 - Existence and Uniqueness of Solutions
- Lecture 35 - Surfaces orthogonal to a given system of surfaces
- Lecture 36 - Nonlinear PDE of first order
- Lecture 37 - Cauchy method of characteristics - I
- Lecture 38 - Cauchy method of characteristics - II
- Lecture 39 - Compatible systems of first order equations
- Lecture 40 - Charpit's method - I
- Lecture 41 - Charpit's method - II
- Lecture 42 - Second Order PDE with Variable Coefficients
- Lecture 43 - Classification and Canonical Form of Second Order PDE - I
- Lecture 44 - Classification and Canonical Form of Second Order PDE - II
- Lecture 45 - Classification and Characteristic Curves of Second Order PDEs
- Lecture 46 - Review of Integral Transforms - I
- Lecture 47 - Review of Integral Transforms - II
- Lecture 48 - Review of Integral Transforms - II
- Lecture 49 - Review of Integral Transforms - III
- Lecture 50 - Laplace Equation - I
- Lecture 51 - Laplace Equation - II
- Lecture 52 - Laplace and Poisson Equations
- Lecture 53 - One dimensional wave equation and its solution - I
- Lecture 54 - One dimensional wave equation and its solution - II
- Lecture 55 - One dimensional wave equation and its solution - III
- Lecture 56 - Two dimensional wave equation and its solution - I
- Lecture 57 - Solution of non-homogeneous wave equation
- Lecture 58 - Solution of homogeneous diffusion equation - I
- Lecture 59 - Solution of homogeneous diffusion equation - II
- Lecture 60 - Duhamel's principle

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

NPTEL Video Course - Mathematics - NOC:Matrix Analysis with Applications

Subject Co-ordinator - Dr. Sanjeev Kumar, S. K. Gupta

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Elementary row operations
- Lecture 2 - Echelon form of a matrix
- Lecture 3 - Rank of a matrix
- Lecture 4 - System of Linear Equations - I
- Lecture 5 - System of Linear Equations - II
- Lecture 6 - Introduction to Vector Spaces
- Lecture 7 - Subspaces
- Lecture 8 - Basis and Dimension
- Lecture 9 - Linear Transformations
- Lecture 10 - Rank and Nullity
- Lecture 11 - Inverse of a Linear Transformation
- Lecture 12 - Matrix Associated with a LT
- Lecture 13 - Eigenvalues and Eigenvectors
- Lecture 14 - Cayley-Hamilton Theorem and Minimal Polynomial
- Lecture 15 - Diagonalization
- Lecture 16 - Special Matrices
- Lecture 17 - More on Special Matrices and Gerschgorin Theorem
- Lecture 18 - Inner Product Spaces
- Lecture 19 - Vector and Matrix Norms
- Lecture 20 - Gram Schmidt Process
- Lecture 21 - Normal Matrices
- Lecture 22 - Positive Definite Matrices
- Lecture 23 - Positive Definite and Quadratic Forms
- Lecture 24 - Gram Matrix and Minimization of Quadratic Forms
- Lecture 25 - Generalized Eigenvectors and Jordan Canonical Form
- Lecture 26 - Evaluation of Matrix Functions
- Lecture 27 - Least Square Approximation
- Lecture 28 - Singular Value Decomposition
- Lecture 29 - Pseudo-Inverse and SVD

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Introduction to Ill-Conditioned Systems
- Lecture 31 - Regularization of Ill-Conditioned Systems
- Lecture 32 - Linear Systems
- Lecture 33 - Linear Systems
- Lecture 34 - Non-Stationary Iterative Methods
- Lecture 35 - Non-Stationary Iterative Methods
- Lecture 36 - Krylov Subspace Iterative Methods (Conjugate Gradient Method)
- Lecture 37 - Krylov Subspace Iterative Methods (CG and Pre-Conditioning)
- Lecture 38 - Introduction to Positive Matrices
- Lecture 39 - Positive Matrices, Positive Eigenpair, Perron Root and vector, Example
- Lecture 40 - Polar Decomposition

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

NPTEL Video Course - Mathematics - NOC:Mathematical Modelling: Analysis and Applications

Subject Co-ordinator - Prof. Ameeya Kumar Nayak

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Introduction to Mathematical Modeling
- Lecture 2 - Discrete Time Linear Models in Population Dynamics - I
- Lecture 3 - Discrete Time Linear Models in Population Dynamics - II
- Lecture 4 - Discrete Time Linear Age Structured Models
- Lecture 5 - Numerical Methods to Compute Eigen Values
- Lecture 6 - Discrete Time Non-Linear Models in Population Dynamics - II
- Lecture 7 - Analysis on Logistic Difference Equation
- Lecture 8 - Classifications of Bifurcation
- Lecture 9 - Discrete Time Non - Linear Models in Population Dynamics - II
- Lecture 10 - Discrete Time Prey - Predator Model
- Lecture 11 - Introduction to Continuous Time Models
- Lecture 12 - Solution of First Order First Degree Differential Equations
- Lecture 13 - Continuous Time Models in Population Dynamics - I
- Lecture 14 - Continuous Time Models in Population Dynamics - II
- Lecture 15 - Stability and Linearization of System of Ordinary Differential Equations
- Lecture 16 - Continuous Time Single Species Models
- Lecture 17 - Qualitative Solution of Differential Equations - Phase Diagrams - I
- Lecture 18 - Qualitative Solution of Differential Equations - Phase Diagrams - II
- Lecture 19 - Continuous Time Lotka - Volterra Competition Model
- Lecture 20 - Continuous Time Prey - Predator Model

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

NPTEL Video Course - Mathematics - NOC:Dynamical System and Control

Subject Co-ordinator - Prof.D. N Pandey, Dr. N. Sukavanam

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Formulation of Dynamical Systems - I
- Lecture 2 - Formulation of Dynamical Systems - II
- Lecture 3 - Existence and Uniqueness Theorem - I
- Lecture 4 - Existence and Uniqueness Theorem - II
- Lecture 5 - Linear Systems - I
- Lecture 6 - Linear Systems - II
- Lecture 7 - Solutions of Linear Systems - I
- Lecture 8 - Solutions of Linear Systems - II
- Lecture 9 - Solutions of Linear Systems - III
- Lecture 10 - Fundamental Matrix - I
- Lecture 11 - Fundamental Matrix - II
- Lecture 12 - Fundamental Matrix for Non-Autonomous systems
- Lecture 13 - Solutions of Non-Homogeneous Systems
- Lecture 14 - Stability of Systems
- Lecture 15 - Stability of Linear Autonomous Systems - I
- Lecture 16 - Stability of Linear Autonomous Systems - II
- Lecture 17 - Stability of Linear Autonomous Systems - III
- Lecture 18 - Stability of Weakly Non-Linear Systems - I
- Lecture 19 - Stability of Weakly Non-Linear Systems - II
- Lecture 20 - Stability of Non-Linear Systems using Linearization
- Lecture 21 - Properties of Phase Portrait
- Lecture 22 - Properties of Orbits
- Lecture 23 - Phase Portrait
- Lecture 24 - Phase Portrait of Linear Differential Equations - I
- Lecture 25 - Phase Portrait of Linear Differential Equations - II
- Lecture 26 - Phase Portrait of Linear Differential Equations - III
- Lecture 27 - Poincare Bendixson Theorem
- Lecture 28 - Limit Cycle
- Lecture 29 - Lyapunov Stability - I

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Lyapunov Stability - II
- Lecture 31 - Introduction to Control Systems - I
- Lecture 32 - Introduction to Control Systems - II
- Lecture 33 - Controllability of Autonomous Systems
- Lecture 34 - Controllability of Non-autonomous Systems
- Lecture 35 - Observability - I
- Lecture 36 - Observability - II
- Lecture 37 - Results on Controllability and Observability
- Lecture 38 - Companion Form
- Lecture 39 - Feedback Control - I
- Lecture 40 - Feedback Control - II
- Lecture 41 - Feedback Control - III
- Lecture 42 - Feedback Control - IV
- Lecture 43 - State Observer
- Lecture 44 - Stabilizability
- Lecture 45 - Introduction to Discrete Systems - I
- Lecture 46 - Introduction to Discrete Systems - II
- Lecture 47 - Lyapunov Stability Theory - I
- Lecture 48 - Lyapunov Stability Theory - II
- Lecture 49 - Lyapunov Stability Theory - III
- Lecture 50 - Optimal Control - I
- Lecture 51 - Optimal Control - II
- Lecture 52 - Optimal Control - III
- Lecture 53 - Optimal Control - IV
- Lecture 54 - Optimal Control for Discrete Systems - I
- Lecture 55 - Optimal Control for Discrete Systems - II
- Lecture 56 - Controllability of Discrete Systems
- Lecture 57 - Observability of Discrete Systems
- Lecture 58 - Stability for Discrete Systems
- Lecture 59 - Relation between Continuous and Discrete Systems - I
- Lecture 60 - Relation between Continuous and Discrete Systems - II

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

NPTEL Video Course - Mathematics - NOC:Advanced Engineering Mathematics

Subject Co-ordinator - Prof. P.N. Agarwal

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Analytic Function

Lecture 2 - Cauchy-Riemann Equations

Lecture 3 - Harmonic Functions, Harmonic Conjugates and Milne's Method

Lecture 4 - Applications to the Problems of Potential Flow - I

Lecture 5 - Applications to the Problems of Potential Flow - II

Lecture 6 - Complex Integration

Lecture 7 - Cauchy's Theorem - I

Lecture 8 - Cauchy's Theorem - II

Lecture 9 - Cauchy's Integral Formula for the Derivatives of Analytic Function

Lecture 10 - Morera's Theorem, Liouville's Theorem and Fundamental Theorem of Algebra

Lecture 11 - Winding Number and Maximum Modulus Principle

Lecture 12 - Sequences and Series

Lecture 13 - Uniform Convergence of Series

Lecture 14 - Power Series

Lecture 15 - Taylor Series

Lecture 16 - Laurent Series

Lecture 17 - Zeros and Singularities of an Analytic Function

Lecture 18 - Residue at a Singularity

Lecture 19 - Residue Theorem

Lecture 20 - Meromorphic Functions

Lecture 21 - Evaluation of real integrals using residues - I

Lecture 22 - Evaluation of real integrals using residues - II

Lecture 23 - Evaluation of real integrals using residues - III

Lecture 24 - Evaluation of real integrals using residues - IV

Lecture 25 - Evaluation of real integrals using residues - V

Lecture 26 - Bilinear Transformations

Lecture 27 - Cross Ratio

Lecture 28 - Conformal Mapping - I

Lecture 29 - Conformal Mapping - II

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Conformal mapping from half plane to disk and half plane to half plane - I
- Lecture 31 - Conformal mapping from disk to disk and angular region to disk
- Lecture 32 - Application of Conformal Mapping to Potential Theory
- Lecture 33 - Review of Z-transforms - I
- Lecture 34 - Review of Z-transforms - II
- Lecture 35 - Review of Z-transforms - III
- Lecture 36 - Review of Bilateral Z-transforms
- Lecture 37 - Finite Fourier Transforms
- Lecture 38 - Fourier Integral and Fourier Transforms
- Lecture 39 - Fourier Series
- Lecture 40 - Discrete Fourier Transforms - I
- Lecture 41 - Discrete Fourier Transforms - II
- Lecture 42 - Basic Concepts of Probability
- Lecture 43 - Conditional Probability
- Lecture 44 - Bayes Theorem and Probability Networks
- Lecture 45 - Discrete Probability Distribution
- Lecture 46 - Binomial Distribution
- Lecture 47 - Negative Binomial Distribution and Poisson Distribution
- Lecture 48 - Continuous Probability Distribution
- Lecture 49 - Poisson Process
- Lecture 50 - Exponential Distribution
- Lecture 51 - Normal Distribution
- Lecture 52 - Joint Probability Distribution - I
- Lecture 53 - Joint Probability Distribution - II
- Lecture 54 - Joint Probability Distribution - III
- Lecture 55 - Correlation and Regression - I
- Lecture 56 - Correlation and Regression - II
- Lecture 57 - Testing of Hypotheses - I
- Lecture 58 - Testing of Hypotheses - II
- Lecture 59 - Testing of Hypotheses - III
- Lecture 60 - Application to Queuing Theory and Reliability Theory

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

NPTEL Video Course - Mathematics - Advanced Matrix Theory and Linear Algebra for Engineers

Subject Co-ordinator - Prof. Vittal Rao

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Prologue - Part 1
Lecture 2 - Prologue - Part 2
Lecture 3 - Prologue - Part 3
Lecture 4 - Linear Systems - Part 1
Lecture 5 - Linear Systems - Part 2
Lecture 6 - Linear Systems - Part 3
Lecture 7 - Linear Systems - Part 4
Lecture 8 - Vector Spaces - Part 1
Lecture 9 - Vector Spaces - Part 2
Lecture 10 - Linear Independence and Subspaces - Part 1
Lecture 11 - Linear Independence and Subspaces - Part 2
Lecture 12 - Linear Independence and Subspaces - Part 3
Lecture 13 - Linear Independence and Subspaces - Part 4
Lecture 14 - Basis - Part 1
Lecture 15 - Basis - Part 2
Lecture 16 - Basis - Part 3
Lecture 17 - Linear Transformations - Part 1
Lecture 18 - Linear Transformations - Part 2
Lecture 19 - Linear Transformations - Part 3
Lecture 20 - Linear Transformations - Part 4
Lecture 21 - Linear Transformations - Part 5
Lecture 22 - Inner Product and Orthogonality - Part 1
Lecture 23 - Inner Product and Orthogonality - Part 2
Lecture 24 - Inner Product and Orthogonality - Part 3
Lecture 25 - Inner Product and Orthogonality - Part 4
Lecture 26 - Inner Product and Orthogonality - Part 5
Lecture 27 - Inner Product and Orthogonality - Part 6
Lecture 28 - Diagonalization - Part 1
Lecture 29 - Diagonalization - Part 2

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Diagonalization - Part 3
- Lecture 31 - Diagonalization - Part 4
- Lecture 32 - Hermitian and Symmetric matrices - Part 1
- Lecture 33 - Hermitian and Symmetric matrices - Part 2
- Lecture 34 - Hermitian and Symmetric matrices - Part 3
- Lecture 35 - Hermitian and Symmetric matrices - Part 4
- Lecture 36 - Singular Value Decomposition (SVD) - Part 1
- Lecture 37 - Singular Value Decomposition (SVD) - Part 2
- Lecture 38 - Back To Linear Systems - Part 1
- Lecture 39 - Back To Linear Systems - Part 2
- Lecture 40 - Epilogue

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

NPTEL Video Course - Mathematics - Ordinary Differential Equations and Applications

Subject Co-ordinator - Prof. A.K. Nandakumaran, Prof. Raju K. George, Prof. P.S. Datti

Co-ordinating Institute - IISc - Bangalore | IIST - Trivandrum | TIFR-CAM - Bangalore

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

Lecture 1 - General Introduction

Lecture 2 - Examples

Lecture 3 - Examples (Continued - I)

Lecture 4 - Examples (Continued - II)

Lecture 5 - Linear Algebra

Lecture 6 - Linear Algebra (Continued - I)

Lecture 7 - Linear Algebra (Continued - II)

Lecture 8 - Analysis

Lecture 9 - Analysis (Continued...)

Lecture 10 - First Order Linear Equations

Lecture 11 - Exact Equations

Lecture 12 - Second Order Linear Equations

Lecture 13 - Second Order Linear Equations (Continued - I)

Lecture 14 - Second Order Linear Equations (Continued - II)

Lecture 15 - Well-posedness and Examples of IVP

Lecture 16 - Gronwall's Lemma

Lecture 17 - Basic Lemma and Uniqueness Theorem

Lecture 18 - Picard's Existence and Uniqueness Theorem

Lecture 19 - Picard's Existence and Uniqueness (Continued...)

Lecture 20 - Cauchy Peano Existence Theorem

Lecture 21 - Existence using Fixed Point Theorem

Lecture 22 - Continuation of Solutions

Lecture 23 - Series Solution

Lecture 24 - General System and Diagonalizability

Lecture 25 - 2 by 2 systems and Phase Plane Analysis

Lecture 26 - 2 by 2 systems and Phase Plane Analysis (Continued...)

Lecture 27 - General Systems

Lecture 28 - General Systems (Continued...) and Non-homogeneous Systems

Lecture 29 - Basic Definitions and Examples

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Stability Equilibrium Points
- Lecture 31 - Stability Equilibrium Points (Continued - I)
- Lecture 32 - Stability Equilibrium Points (Continued - II)
- Lecture 33 - Second Order Linear Equations (Continued - III)
- Lecture 34 - Lyapunov Function
- Lecture 35 - Lyapunov Function (Continued...)
- Lecture 36 - Periodic Orbits and Poincare Bendixon Theory
- Lecture 37 - Periodic Orbits and Poincare Bendixon Theory (Continued...)
- Lecture 38 - Linear Second Order Equations
- Lecture 39 - General Second Order Equations
- Lecture 40 - General Second Order Equations (Continued...)

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

NPTEL Video Course - Mathematics - NOC:Linear Algebra

Subject Co-ordinator - Prof. Dilip P. Patil

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Introduction to Algebraic Structures - Rings and Fields
- Lecture 2 - Definition of Vector Spaces
- Lecture 3 - Examples of Vector Spaces
- Lecture 4 - Definition of subspaces
- Lecture 5 - Examples of subspaces
- Lecture 6 - Examples of subspaces (Continued...)
- Lecture 7 - Sum of subspaces
- Lecture 8 - System of linear equations
- Lecture 9 - Gauss elimination
- Lecture 10 - Generating system, linear independence and bases
- Lecture 11 - Examples of a basis of a vector space
- Lecture 12 - Review of univariate polynomials
- Lecture 13 - Examples of univariate polynomials and rational functions
- Lecture 14 - More examples of a basis of vector spaces
- Lecture 15 - Vector spaces with finite generating system
- Lecture 16 - Steinitz's exchange theorem and examples
- Lecture 17 - Examples of finite dimensional vector spaces
- Lecture 18 - Dimension formula and its examples
- Lecture 19 - Existence of a basis
- Lecture 20 - Existence of a basis (Continued...)
- Lecture 21 - Existence of a basis (Continued...)
- Lecture 22 - Introduction to Linear Maps
- Lecture 23 - Examples of Linear Maps
- Lecture 24 - Linear Maps and Bases
- Lecture 25 - Pigeonhole principle in Linear Algebra
- Lecture 26 - Interpolation and the rank theorem
- Lecture 27 - Examples
- Lecture 28 - Direct sums of vector spaces
- Lecture 29 - Projections

Get Digi-MAT (Digital Media Access Terminal) For High-Speed Video Streaming of NPTEL and Educational Video Courses in LAN

www.digimat.in

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

- Lecture 30 - Direct sum decomposition of a vector space
- Lecture 31 - Dimension equality and examples
- Lecture 32 - Dual spaces
- Lecture 33 - Dual spaces (Continued...)
- Lecture 34 - Quotient spaces
- Lecture 35 - Homomorphism theorem of vector spaces
- Lecture 36 - Isomorphism theorem of vector spaces
- Lecture 37 - Matrix of a linear map
- Lecture 38 - Matrix of a linear map (Continued...)
- Lecture 39 - Matrix of a linear map (Continued...)
- Lecture 40 - Change of bases
- Lecture 41 - Computational rules for matrices
- Lecture 42 - Rank of a matrix
- Lecture 43 - Computation of the rank of a matrix
- Lecture 44 - Elementary matrices
- Lecture 45 - Elementary operations on matrices
- Lecture 46 - LR decomposition
- Lecture 47 - Elementary Divisor Theorem
- Lecture 48 - Permutation groups
- Lecture 49 - Canonical cycle decomposition of permutations
- Lecture 50 - Signature of a permutation
- Lecture 51 - Introduction to multilinear maps
- Lecture 52 - Multilinear maps (Continued...)
- Lecture 53 - Introduction to determinants
- Lecture 54 - Determinants (Continued...)
- Lecture 55 - Computational rules for determinants
- Lecture 56 - Properties of determinants and adjoint of a matrix
- Lecture 57 - Adjoint-determinant theorem
- Lecture 58 - The determinant of a linear operator
- Lecture 59 - Determinants and Volumes
- Lecture 60 - Determinants and Volumes (Continued...)