

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

NPTEL Video Course - Mathematics - NOC:Fourier Analysis and its Applications

Subject Co-ordinator - Prof. G. K Srinivasan

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Genesis and a little history
- Lecture 2 - Basic convergence theorem
- Lecture 3 - Riemann Lebesgue Lemma
- Lecture 4 - The ubiquitous Gaussian
- Lecture 5 - Jacobi theta function identity
- Lecture 6 - The Riemann zeta function
- Lecture 7 - Bessel's functions of the first kind
- Lecture 8 - Least square approximation
- Lecture 9 - Parseval formula. Isoperimetric theorem
- Lecture 10 - Dirichlet problem for a disc
- Lecture 11 - The Poisson kernel
- Lecture 12 - Cesaro summability and Fejer's theorem
- Lecture 13 - Fejer's theorem (Continued...)
- Lecture 14 - Kronecker's theorem
- Lecture 15 - Weyl's equidistribution theorem
- Lecture 16 - Borel's theorem and beyond
- Lecture 17 - Fourier transform and Schwartz space
- Lecture 18 - Hermite's differential equation
- Lecture 19 - Fourier inversion theorem Riemann Lebesgue lemma
- Lecture 20 - Plancherel's Theorem
- Lecture 21 - Heat equation. The heat kernel
- Lecture 22 - The Airy's function
- Lecture 23 - Exercises on Fourier Transform
- Lecture 24 - Principle of equipartitioning of energy
- Lecture 25 - A formula of Srinivasa Ramanujan
- Lecture 26 - Sturm Liouville problems. Orthogonal systems
- Lecture 27 - Vibrations of a circular membrane
- Lecture 28 - Fourier Bessel Series
- Lecture 29 - Properties of Legendre Polynomials

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- Lecture 30 - Properties of Legendre polynomials (Continued...)
- Lecture 31 - Legendre polynomials - interlacing of zeros
- Lecture 32 - Laplace's integrals for Legendre polynomials
- Lecture 33 - Regular Sturm-Liouville problems
- Lecture 34 - Variational properties of eigen-values
- Lecture 35 - The Dirichlet principle
- Lecture 36 - Regular Sturm-Liouville problems - Existence of eigen-values
- Lecture 37 - The Bergman space
- Lecture 38 - The Banach Steinhaus' Theorem
- Lecture 39 - Hilbert space basics
- Lecture 40 - Completeness of Hermite functions
- Lecture 41 - Hermite, Laguerre and Tchebycheff's polynomials
- Lecture 42 - Orthonormal bases in Hilbert spaces
- Lecture 43 - Non-separable Hilbert-spaces. Almost periodic functions
- Lecture 44 - Hilbert-Schmidt operators. Green's functions
- Lecture 45 - Spectrum of a bounded linear operator
- Lecture 46 - Weak (sequential) compactness of the closed unit ball
- Lecture 47 - Compact self-adjoint operators. Existence of eigen values
- Lecture 48 - Compact self-adjoint operators. Existence of eigen values (Continued...)
- Lecture 49 - Celestial Mechanics
- Lecture 50 - Inverting the Kepler equation using Fourier series
- Lecture 51 - Odds and Ends
- Lecture 52 - Dirichlet's Theorem on Fourier Series
- Lecture 53 - Dirichlet's Theorem on Fourier Series (Continued...)
- Lecture 54 - Topology on the Schwartz space
- Lecture 55 - Examples of tempered distributions
- Lecture 56 - Operations on distributions
- Lecture 57 - Fourier Transform of tempered distribution
- Lecture 58 - Support of a Distribution. Distributions with point support
- Lecture 59 - Distributional solutions of ODEs. Continuity of the Fourier transform and differentiation
- Lecture 60 - The Poisson summation formula