

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

NPTEL Video Course - Mathematics - NOC:Measure Theory (Prof. Indrava Roy)

Subject Co-ordinator - Prof. Indrava Roy

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Finite Sets and Cardinality
Lecture 2 - Infinite Sets and the Banach-Tarski Paradox - Part 1
Lecture 3 - Infinite Sets and the Banach-Tarski Paradox - Part 2
Lecture 4 - Elementary Sets and Elementary measure - Part 1
Lecture 5 - Elementary Sets and Elementary measure - Part 2
Lecture 6 - Properties of elementary measure - Part 1
Lecture 7 - Properties of elementary measure - Part 2
Lecture 8 - Uniqueness of elementary measure and Jordan measurability - Part 1
Lecture 9 - Uniqueness of elementary measure and Jordan measurability - Part 2
Lecture 10 - Characterization of Jordan measurable sets and basic properties of Jordan measure - Part 1
Lecture 11 - Characterization of Jordan measurable sets and basic properties of Jordan measure - Part 2
Lecture 12 - Examples of Jordan measurable sets-I
Lecture 13 - Examples of Jordan measurable sets-II - Part 1
Lecture 14 - Examples of Jordan measurable sets-II - Part 2
Lecture 15 - Jordan measure under Linear transformations - Part 1
Lecture 16 - Jordan measure under Linear transformations - Part 2
Lecture 17 - Connecting the Jordan measure with the Riemann integral - Part 1
Lecture 18 - Connecting the Jordan measure with the Riemann integral - Part 2
Lecture 19 - Outer measure - Motivation and Axioms of outer measure
Lecture 20 - Comparing Inner Jordan measure, Lebesgue outer measure and Jordan Outer measure
Lecture 21 - Finite additivity of outer measure on Separated sets, Outer regularity - Part 1
Lecture 22 - Finite additivity of outer measure on Separated sets, Outer regularity - Part 2
Lecture 23 - Lebesgue measurable class of sets and their Properties - Part 1
Lecture 24 - Lebesgue measurable class of sets and their Properties - Part 2
Lecture 25 - Equivalent criteria for lebesgue measurability of a subset - Part 1
Lecture 26 - Equivalent criteria for lebesgue measurability of a subset - Part 2
Lecture 27 - The measure axioms and the Borel-Cantelli Lemma
Lecture 28 - Properties of the Lebesgue measure
Lecture 29 - Properties of the Lebesgue measure

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- Lecture 30 - Lebesgue measurability under Linear transformation, Construction of Vitali Set - Part 1
- Lecture 31 - Lebesgue measurability under Linear transformation, Construction of Vitali Set - Part 2
- Lecture 32 - Abstract measure spaces
- Lecture 33 - Abstract measure and Caratheodory Measurability - Part 1
- Lecture 34 - Abstract measure and Caratheodory Measurability - Part 2
- Lecture 35 - Abstrsct measure and Hahn-Kolmogorov Extension
- Lecture 36 - Lebesgue measurable class vs Caratheodory extension of usual outer measure on \mathbb{R}^d
- Lecture 37 - Examples of Measures defined on \mathbb{R}^d via Hahn Kolmogorov extension - Part 1
- Lecture 38 - Examples of Measures defined on \mathbb{R}^d via Hahn Kolmogorov extension - Part 2
- Lecture 39 - Measurable functions
- Lecture 40 - Measurable functions
- Lecture 41 - Egorov's theorem
- Lecture 42 - Lebesgue integral of unsigned simple measurable functions
- Lecture 43 - Lebesgue integral of unsigned measurable functions
- Lecture 44 - Fundamental convergence theorems in Lebesgue integration
- Lecture 45 - Lebesgue integral for complex and real measurable functions
- Lecture 46 - Basic properties of L^1 -functions and Lebesgue's Dominated convergence theorem
- Lecture 47 - L^1 functions on \mathbb{R}^d
- Lecture 48 - L^1 functions on \mathbb{R}^d
- Lecture 49 - L^1 functions on \mathbb{R}^d
- Lecture 50 - L^1 functions on \mathbb{R}^d
- Lecture 51 - Various modes of convergence of measurable functions
- Lecture 52 - Easy implications from one mode of convergence to another
- Lecture 53 - Implication map for modes of convergence with various examples
- Lecture 54 - Uniqueness of limits across various modes of convergence
- Lecture 55 - Some criteria for reverse implications for modes of convergence
- Lecture 56 - Riesz Representation theorem- Motivation
- Lecture 57 - Basics on Locally compact Hausdorff spaces
- Lecture 58 - Borel and Radon measures on LCH spaces
- Lecture 59 - Properties of Radon measures and Lusin's theorem on LCH spaces
- Lecture 60 - Riesz Representation theorem - Complete statement and proof - Part 1
- Lecture 61 - Riesz Representation theorem - Complete statement and proof - Part 2
- Lecture 62 - Examples of measures constructed using RRT
- Lecture 63 - Theorems of Tonelli and Fubini- interchanging the order of integration for repeated integrals
- Lecture 64 - Product measures
- Lecture 65 - Tonelli's theorem for sets - Part 1
- Lecture 66 - Tonelli's theorem for sets - Part 2
- Lecture 67 - Fubini-Tonelli theorem
- Lecture 68 - Lebesgue's differentiation theorem

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- Lecture 69 - Lebesgue's differentiation theorem
- Lecture 70 - Lebesgue's differentiation theorem
- Lecture 71 - Differentiation theorems
- Lecture 72 - Differentiation theorems
- Lecture 73 - Riesz's Rising Sun Lemma
- Lecture 74 - Differentiation theorem for monotone continuous functions
- Lecture 75 - Differentiation theorem for general monotone functions and Second fundamental theorem of calculus