

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

NPTEL Video Course - Mathematics - NOC:Measure Theory (Prof. E. K. Narayanan)

Subject Co-ordinator - Prof. E. K. Narayanan

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Review of Riemann integration and introduction to sigma algebras

Lecture 2 - Sigma algebras and measurability

Lecture 3 - Measurable functions and approximation by simple functions

Lecture 4 - Properties of countably additive measures

Lecture 5 - Integration of positive measurable functions

Lecture 6 - Some properties of integrals of positive simple functions

Lecture 7 - Monotone convergence theorem and Fatou's lemma

Lecture 8 - Integration of complex valued measurable functions

Lecture 9 - Dominated convergence theorem

Lecture 10 - Sets of measure zero and completion

Lecture 11 - Consequences of MCT, Fatou's lemma and DCT

Lecture 12 - Rectangles in  $\mathbb{R}^n$  and some properties

Lecture 13 - Outer measure on  $\mathbb{R}^n$

Lecture 14 - Properties of outer measure on  $\mathbb{R}^n$

Lecture 15 - Lebesgue measurable sets and Lebesgue measure on  $\mathbb{R}^n$

Lecture 16 - Lebesgue sigma algebra

Lecture 17 - Lebesgue measure

Lecture 18 - Fine properties of measurable sets

Lecture 19 - Invariance properties of Lebesgue measure

Lecture 20 - Non measurable set

Lecture 21 - Measurable functions

Lecture 22 - Riemann and Lebesgue integrals

Lecture 23 - Locally compact Hausdorff spaces

Lecture 24 - Riesz representation theorem

Lecture 25 - Positive Borel measures

Lecture 26 - Lebesgue measure via Riesz representation theorem

Lecture 27 - Construction of Lebesgue measure

Lecture 28 - Invariance properties of Lebesgue measure

Lecture 29 - Linear transformations and Lebesgue measure

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

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- Lecture 30 - Cantor set
- Lecture 31 - Cantor function
- Lecture 32 - Lebesgue set which is not Borel
- Lecture 33 -  $L^p$  spaces
- Lecture 34 -  $L^p$  norm
- Lecture 35 - Completeness of  $L^p$
- Lecture 36 - Properties of  $L^p$  spaces
- Lecture 37 - Examples of  $L^p$  spaces
- Lecture 38 - Product sigma algebra
- Lecture 39 - Product measures - I
- Lecture 40 - Product measures - II
- Lecture 41 - Fubini's theorem - I
- Lecture 42 - Fubini's theorem - II
- Lecture 43 - Completeness of product measures
- Lecture 44 - Polar coordinates
- Lecture 45 - Applications of Fubini's theorem
- Lecture 46 - Complex measures - I
- Lecture 47 - Complex measures - II
- Lecture 48 - Absolutely continuous measures
- Lecture 49 -  $L^2$  space
- Lecture 50 - Continuous linear functionals
- Lecture 51 - Radon-Nikodym theorem - I
- Lecture 52 - Radon Nikodym theorem - II
- Lecture 53 - Consequences of Radon-Nikodym theorem - I
- Lecture 54 - Consequences of Radon-Nikodym theorem - II
- Lecture 55 - Continuous linear functionals on  $L^p$  spaces - I
- Lecture 56 - Continuous linear functionals on  $L^p$  spaces - II
- Lecture 57 - Riesz representation theorem - I
- Lecture 58 - Riesz representation theorem - II
- Lecture 59 - Hardy-Littlewood maximal function
- Lecture 60 - Lebesgue differentiation theorem
- Lecture 61 - Absolutely continuous functions - I
- Lecture 62 - Absolutely continuous functions - II