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

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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...)
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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
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