

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

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- 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

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- 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...)

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- 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...)