## **Outline of Applied Stochastic Analysis**

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- Lect01 Introduction
- Lect02 Random Variables
- Lect03 Generation of RVs
- Lect04 Variance Reduction
- Lect05 Limit Theorems
- Lect06 Discrete-Time Markov Chains
- Lect07 Q-Process
- Lect08 Metropolis Algorithm
- Lect09 Multilevel Sampling and KMC
- Lect10 Simulated Annealing and QMC
- Lect11 Random Walk and Brownian Motion
- Lect12 Stochastic Process and Brownian Motion
- Lect13 Construction of BM and Its Properties
- Lect14 SDE and Itô's Formula
- Lect15 Connections with PDE
- Lect16 Multiscale Analysis of SDEs
- Lect17 Numerical SDEs: Basics
- Lect18 Numerical SDEs: Advanced Topics
- Lect19 Path Integral and Girsanov Transformation
- Lect20 Application in Rare Events
- Lect21 Application in Biology (Chemical Reaction Kinetics)
- Lect22 Application in Complex Fluids
- Lect23 Application in Complex Networks