Building Option Pricing Models

1. Basic Notions
   - Definition and Terms
   - Positions
   - Determinants

2. Types of Options and Payoffs
   - Plain Vanilla
   - Exotic
     - First generation
     - Second generation

3. Cash Flow Valuation
   - AD pricing
   - Adjusted rate
   - Adjusted expectation

4. Fundamental Theories, Derivative Pricing, and Solutions

5. Underlying Process
   - Statistical Properties

   - Filtration
   - Adopted process
   - Martingales
   - Conditional expectation

7. Expanding Wiener Process
   - Generalized Wiener Process
   - Generalized Price Process
   - Interpretation of the Rates
   - Itô Process
   - ABM and Characteristics
   - Ornstein-Uhlenbeck Process
   - GBM and characteristics
   - Other Dynamics
     - Local Volatility (Dupire model)
     - Stochastic Volatility (Heston, GARCH, and SABR models)
     - Jump Diffusion (Merton Jump model)

8. Noise Distributions
   - HEX
   - Cauchy
   - Shifted Log Normal
   - Inverse Log Normal

   - Stochastic Calculus
   - Taylor Expansion
   - Itô’s Lemma

10. Application: CSO