

SS 4521G/FM 9521B - Advanced Financial Modelling

Outline of Lectures: 03-07 February 2014

For this week, we aim to cover the following theories/concepts:

1. We shall look at how the Black-Scholes-Merton PDEs for European call and put prices get modified when *(i)* the underlying asset pays a known dividend, *(ii)* the underlying is a stock index, *(iii)* the underlying is a currency, *(iv)* the underlying is a commodity price and *(v)* the underlying is a futures contract.
2. Revisit the simulation of random walk and its convergence to Brownian motion
3. Basics of Monte-Carlo simulation. Application to valuation of options and implementation in the Excel software will be considered.
4. Models for interest rate process in the context of simulation
5. Zero-coupon bond prices under the Ho-Lee, Vasiček and Cox-Ross-Ingersoll models
6. More on Delta hedging
7. Stop-loss strategy, naked and covered positions

8. Other Greek Letters: Theta, Gamma, Vega and Rho