FM 9561B - Fixed-Income Modelling
Outline of Lectures: $20 - 24$ January 2014

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

1. Recap of Itô's differentiation rule.

2. Quadratic variation of a geometric Brownian motion.

3. Examples of Itô processes.

4. The generalised one-dimensional case of Itô lemma.

Some elements of financial valuation

5. Investor's wealth process and the pricing of a contingent claim

6. Description of an Itô process

7. Re-visiting the generalised Itô's lemma for one dimensional case

8. Delta-hedging, replicating portfolio and the PDE approach in option pricing

9. Feynman-Kac's theorem

10. Solving for the mean and variance of a stochastic process without having to solve the SDE. The method will be illustrated using the Cox-Ingersoll-Ross interest rate model

11. Cross-variations of BMs and the multi-dimensional Itô's formula

12. Change of measure (Girsanov's theorem) and applications in finance