

Maths 190

Topics be covered for the week of 13 - 17 March 2017

Reminder: Wednesday, 15 March 2017 - Long Exam 2

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

1. Stochastic differential equation of the form $dX_t = \mu(X_t, t)dt + \sigma(X_t, t)dW_t$
2. Itô's lemma/Itô's differentiation rule
3. The "multiplication rule"
4. The geometric Brownian motion as a model for price dynamics
5. Risk-neutral pricing of European options: The Black-Scholes option pricing formula will be derived using the risk-neutral approach. The put-call parity will be revisited.
6. We shall look at how the Black-Scholes-Merton European call price gets modified to take into account 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.
7. **Interest and currency swaps**