
Teaching Assistant: Oana Fainarea. Office: 608. Phone: 212-998-3138. Email: fainarea@cims.nyu.edu. Office hours: Tuesday 4-5 and Tues 6-7.


Prerequisites: Derivative Securities and Stochastic Calculus, or equivalent.

Content: This is a “second course” in arbitrage-based pricing of derivative securities, continuing where the “first course” Derivative Securities left off. The first 1/3 of the semester will be devoted to the Black-Scholes model and its generalizations (equivalent martingale measures; the martingale representation theorem; the market price of risk; applications including change of numeraire and the analysis of quantos). The next 1/3 will be devoted to interest rate models (the Heath-Jarrow-Morton approach and its relation to short-rate models; applications including mortgage-backed securities). The last 1/3 will address more advanced topics, including the volatility smile/skew and approaches to accounting for it (underlyings with jumps, local volatility models, and stochastic volatility models).

Course requirements: There will be several homework sets, one every couple of weeks, probably 6 in all. Collaboration on homework is encouraged (homeworks are not exams) but registered students must write up and turn in their solutions individually. There will be one in-class final exam.

Lecture notes: Lecture notes and homework sets will be handed out, and also posted on my web-site as they become available.

Books: We will not follow any single textbook. However I strongly recommend

It correlates strongly with the material we’ll cover in the first 2/3 of the semester. I’ll also draw material from the following books, which will be on reserve in the CIMS library:


- D. Lamberton and B. Lapeyre, *Introduction to stochastic calculus applied to finance*, Chapman and Hall, 1996


You’ll notice there’s nothing on the volatility smile/skew in this list. That’s because I haven’t yet decided what sources to use for the final 1/3 semester. The reserve list will be augmented as appropriate.