

Computing & Programming in Finance (June 2006)

This is a “how-to” course that concentrates on the use of Excel spreadsheets and the Visual Basic for Applications programming language to cover the broad area of models in Finance from the very earliest (Portfolio Theory) to the very latest (Variance Gamma Option pricing). For each model we will follow the path from mathematical equations to spreadsheet model and then onto VBA program code.

Each week’s workshop will be based around Excel spreadsheets incorporating VBA user-defined functions that will develop into a class library of numeric functions. The course will stress the comparative accuracy and speed of numerical methods rather than mere programming skills. We will cover nearly all the material in our Advanced Modelling in Finance using Excel and VBA book. In addition, we will use examples of additional material as practical exercises to be developed by students.

The planned list of subjects for the sessions is as follows:

1. Advanced Modelling in Excel
Advanced Excel Functions (AMF, Chap 2)
Examples on Project Valuation such as Eurotunnel
2. Portfolio Theory and Asset Pricing
Portfolio Optimisation (Chap 6)
Asset Pricing (Chap 7)
Example using LTCM (Jorion article)
3. Visual Basic for Applications
Introduction and Macros (Chap 3)
User-defined Functions (Chap 4)
4. Pricing European Options
Black-Scholes (Chap 11)
Monte Carlo Simulation and Numerical Integration (Chap 12)
Example on Variance Gamma option pricing
5. Pricing American Options
Binomial Trees (Chap 10)
Trinomial Trees
Example on Ju-Zhong Pricing Approximation
6. Interest Rate Models
Introduction to Bonds (Chap 14)
Interest Rate Models (Chap 15)
7. Interest Rate Trees
Arrow-Debreu Prices
Lognormal and Normal Binomial Trees (Chap 16)
Hull-White Trinomial Trees

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AMF = Advanced Modelling in Finance using Excel and VBA by Mary Jackson and Mike Staunton (Wiley, 2001)