J.R.M. Röman

Analytical Finance: Volume I
The Mathematics of Equity Derivatives, Markets, Risk and Valuation

- Combines theory and practice: the author combines rigorous academic theory with his many years’ practical experience to create a thorough, applied text on equity derivatives
- Provides comprehensive coverage of the many theoretical and market approaches, problems and solutions to all the main modeling challenges for equity practitioners
- Presents classroom-tested content: it has been used and developed over many years on the financial engineering MSc at the University of Mälardalen

This book provides an introduction to the valuation of financial instruments on equity markets. Written from the perspective of trading, risk management and quantitative research functions and written by a practitioner with many years’ experience in markets and in academia, it provides a valuable learning tool for students and new entrants to these markets.

Coverage includes:

Trading and sources of risk, including credit and counterparty risk, market and model risks, settlement and Herstatt risks.

Numerical methods including discrete-time methods, finite different methods, binomial models and Monte Carlo simulations.

- Probability theory and stochastic processes from the financial modeling perspective, including probability spaces, sigma algebras, measures and filtrations.

- Continuous time models such as Black-Scholes-Merton; Delta-hedging and Delta-Gamma-hedging; general diffusion models and how to solve Partial Differential Equation using the Feynmann-Kac representation.

- The trading, structuring and hedging several kinds of exotic options, including: Binary/Digital options; Barrier options; Lookbacks; Asian options; Chooses; Forward options; Ratchets; Compounded options; Basket options; Exchange and Currency-linked options; Pay later options and Quantos.

- A detailed explanation of how to construct synthetic instruments and strategies for different market conditions, discussing more than 30 different option strategies.