QFRC Practitioner Workshop

6 – 7 August, Sydney

Quantitative Finance Research Centre

UNIVERSITY OF TECHNOLOGY SYDNEY

Stochastic Calculus in Finance

The aim of this course is to present and deepen the various mathematical concepts, techniques and intuition necessary for modern financial and insurance modelling, derivative pricing, portfolio optimization and risk management. This subject provides the foundations for a sufficiently rigorous mathematical treatment of these topics. It enables the participants to confidently apply the Theory of Stochastic Processes and Stochastic Calculus. This course prepares for the later envisaged courses **Mathematical Methods in Finance** and **Numerical Methods in Finance**. All three courses are based on the two monographs: Platen & Heath: *A Benchmark Approach to Quantitative Finance*, Springer 2006; and Kloeden & Platen: *Numerical Solution of Stochastic Differential Equations*, Springer, 1999.

Key Objectives

- To define and illustrate the terms used in the study of stochastic processes including Brownian motion, martingales and jump diffusions.
- To demonstrate and apply techniques of stochastic calculus in finance and insurance.
- To formulate and solve financial problems involving stochastic differential equations and jump diffusions.

Key Benefits

- An ability to communicate clearly problems in continuous time finance and obtain solutions to the problems requiring such knowledge.
- A preparedness to undertake further study in the mathematics of finance or quantitative finance.

Presenter: Eckhard Platen

Professor Platen joined UTS in 1997 from ANU. He was a joint appointment between the School of Finance and Economics and the School of Mathematical Sciences to the Chair in Quantitative Finance.
Prior to this appointment Eckhard was the Founding Head of the Centre for Financial Mathematics at the Institute of Advanced Studies at the Australian National University in Canberra. He completed a PhD in Mathematics at the Technical University in Dresden and obtained his Dr.sc. from the Academy of Sciences in Berlin, where he headed the Sector of Stochastics.
Eckhard co-authored three successful books on numerical methods and finance published by Springer Verlag, and has published more than 140 research papers in quantitative finance, insurance and applicable mathematics. Eckhard serves on the Editorial Boards of five journals including Mathematical Finance and Quantitative Finance and previously another two journals. He is initiator and co-organizer of the annual Quantitative Methods in Finance conference series. His invited practitioner workshops, recently presented in New York, Frankfurt, Chicago, Cape Town and Munich, have been very successful.

Stochastic Calculus in Finance Workshop Breakdown

Preliminaries from Probability Theory

Summary of the basic concepts and results of probability theory relevant for quantitative finance.

Modelling via Stochastic Processes

Introduction to stochastic processes including Markov chains, Markov processes, Wiener process, Poisson process, Lévy processes.

Diffusion Processes

Geometric Brownian motion, Ornstein-Uhlenbeck process, square root process, Kolmogoroff forward and backward equations, multi-dimensional diffusions.

Martingales and Stochastic Integrals

Introduction to the concept of martingales, quadratic variation. Definition of stochastic integrals in the context of gains from trade, driven by Wiener processes, Poisson processes and Lévy processes.

Itô formula or Stochastic Chain Rule

Itô formula - the fundamental tool for manipulation of stochastic processes. Presentation of various applications of the Itô formula.

Stochastic Differential Equations

Introduction to stochastic differential equations, which allow to model feedback in stochastic dynamics. Explicit solutions of stochastic differential equations. Vector stochastic differential equations and stochastic differential equations with jumps.

Recommended Reading

Please aim to read Chapters 1-7 in Platen & Heath: A Benchmark Approach to Quantitative Finance. Springer Finance 2006 (available at Co-op Bookshop at the corner of Broadway & Harris Street). The course will follow this book closely.

Information

Two workshop days:

$2,200.00 (incl. GST)

The registration fee also includes morning and afternoon teas, and light lunch.

Date, Time

6 – 7 August 2009

9:00 -5:00 pm

Venue

Bloomberg, Level 36,
1 Macquarie Place, Sydney

The number of participants is limited. Please register as soon as possible.

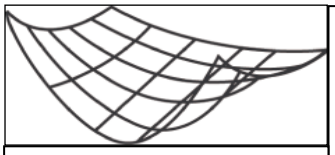
Registration

Contact the Workshop Coordinator to receive a registration form, or visit the QFRC website.

Contact Details

Quantitative Finance Research Centre
School of Finance and Economics
University of Technology, Sydney
PO Box 123
Broadway NSW 2007, Australia

Tel: +612 9514 7748 Fx: +612 9514 7722
Email: qfrc@uts.edu.au
www.qfrc.uts.edu.au



QMF2009

16 — 19 December 2009

Focus: Credit Risk, Risk Management, Derivatives Pricing, High Dimensional Quantitative Methods and other areas of Quantitative Finance

For further information see the QMF2009 conference website at:
www.qfrc.uts.edu.au/qmf