

# GF03 (Equities, Foreign Exchange and Commodities Modelling)

<i>Year:</i>	2016–2017
<i>Code:</i>	MATHGF03
<i>Value:</i>	15 UCL credits (= 6 ECTS)
<i>Term:</i>	1
<i>Structure:</i>	3 hour lectures per week
<i>Assessment:</i>	100% examination. Student must achieve at least 50% to pass this course.
<i>Normal Pre-requisites:</i>	MATHGM21 Quantitative & Computational Finance COMPG008 Stochastic Processes for Finance
<i>Lecturer:</i>	Dr D Schwarz

## *Course Description and Objectives*

The objective of this course is to introduce mathematical concepts and tools used in the finance industry to model and price advanced equity foreign exchange and commodities instruments.

The content of the course is divided into three parts:

Part 1 - (Arbitrage-free pricing theory and equity markets): Replication strategies; risk-neutral pricing; Brownian motion; Ito calculus; First and Second Fundamental Theorems of Asset Pricing; examples from equity markets.

Part 2 - (Foreign Exchange Markets): Modelling of FX markets; foreign and domestic risk-neutral measures; forward measures; triangular arbitrage and the carry trade.

Part 3 - (Commodity Markets): Modelling of electricity, gas and metal prices; jump diffusion processes; pricing of energy derivatives.

## *Recommended Texts*

For part 1 and 2:

Steven Shreve, *Stochastic Calculus for Finance II: Continuous Time Models*, Springer Finance, 2004.

For part 3:

Alexander Eydeland and Krzysztof Wolyniec, *Energy and Power Risk Management: New Development in Modelling, Pricing and Hedging*, Wiley, 2000.