Mathematical Finance (1 Year) [MSc]

Aims of the programme

The programme's primary aim is to provide students with a knowledge and understanding of the main theoretical and applied concepts in the mathematics underlying modern finance theory. The focus of the programme is on mathematical theory and modelling, drawing from the disciplines of probability theory, scientific computing and partial differential equations to model relations between asset prices and interest rates, and to develop models for pricing, risk management and financial product development.

A further programme aim is to develop students' power of inquiry, critical analysis and logical thinking and to apply theoretical knowledge to current issues of policy and practice. These skills will be essential in carrying out a piece of original empirical research. This research constitutes the final dissertation stage of the Masters programme. To this end, the programme offers high quality teaching informed by theoretical and empirical research and is taught by research-active staff.

Finally, the programme aims to provide a thorough training in financial mathematics to prepare students for careers in areas such as financial engineering, risk and investment management and derivative pricing. It also aims to provide many of the tools required to undertake high quality research in academic and financial institutions [MSc only]. The programme meets the requirements of the national qualifications framework for a level M (Masters) degree.

Intended Learning Outcomes of the programme

Upon completion of the programme, students passing at the MSc level of achievement should be able to demonstrate:

1. Have advanced knowledge and systematic understanding of the main theoretical and applied concepts in mathematical finance including: hedging strategies; binomial model; risk-neutral valuation; diffusion-type models for stock prices; Black-Scholes equation, stochastic volatility models.
2. Have a comprehensive knowledge and understanding of derivatives and financial engineering.
3. Have a critical understanding of stochastic calculus and be able to apply stochastic processes in discrete and continuous financial models.
4. Be able to draw from the disciplines of probability theory, scientific computing and partial differential equations to derive relations between fundamental variables such as asset pricing, market movements and interest rates, which can be used to develop models for pricing, monitoring, risk management and product development.
5. Knowledge and expertise in the development of a research enquiry and to select the tools necessary for executing the research; the skills to pursue independent learning, to analyse and interpret quantitative and qualitative data and to present results in a form that is appropriate.
6. A critical awareness of research issues, methodologies and methods in mathematical finance, combined with a knowledge of corresponding skills in planning and managing a research project equipping students to carry out a piece of research.

Course descriptions on each course unit includes information on assessment criteria's, lecturer, syllabus, learning outcomes, etc., and they are available from the 'My Course' tab in 'My Manchester' by searching the subject code or you can browse them from the Schools 'Study' website.

Level 6 course units

Description	Semester	Requirement	Credit Rating	Level
BMAN70141 - Derivative Securities	1	Mandatory	15	6
BMAN70381 - Asset Pricing Theory	1	Mandatory	15	6
MATH67101 - Stochastic Calculus	1	Mandatory	15	6
MATH67201 - Martingales Theory for Finance	1	Mandatory	15	6
MATH60082 - Computational Finance	2	Mandatory	15	6
MATH67112 - Brownian Motion	2	Mandatory	15	6
MATH69102 - Stochastic Modelling in Finance	2	Mandatory	15	6
MATH69122 - Stochastic Control with Applications to Finance	2	Mandatory	15	6