Master of Science (MSc) Program in Financial Mathematics

Program Director:

Bingyi JING, Professor of Mathematics

The Master of Science (MSc) program in Financial Mathematics aims to prepare students with science or engineering background for high-tech careers in the banking and financial sectors in Hong Kong. The curriculum provides training in statistical and computing tools in quantitative finance and risk management, and the understanding of financial models and their applications on derivative products traded in the markets. This degree program upgrades students' knowledge of mathematical methods, probability, statistics and stochastic calculus beyond the bachelor's level of Mathematics. Also, through the courses on the quantitative aspects of pricing exotic derivative products and managing portfolio of assets, students will attain a real understanding of the underlying assumptions and the ability to critically ascertain the applicability and limitations of various mathematical models in derivative pricing and credit risk analysis.

The current state of advanced technology in the financial industry includes mathematical modeling of structured financial instruments, quantitative risk analysis and dynamical asset allocation. Implementation of all these tasks may require medium to large scale computations. Graduates from this program will be suited for jobs involved in financial product development and pricing (custom derivatives, insurance products etc.), investment decision support and fund management (asset allocation, portfolio selection etc.), and risk management (portfolio immunization and management, hedging of exchange rate, interest rate or commodities risks).

On completion of the program, students are expected to have:

- A broad knowledge and an understanding of the financial products commonly traded in the markets and various practical aspects of risk management.

- The ability to apply mathematical and statistical tools to construct quantitative models in derivative pricing, quantitative trading strategies, risk management, and scenario simulation, including appropriate solution methods and interpretation of results.

Admission Requirements

Applicants must possess a bachelor's degree in Mathematics/ Engineering/ Physical Sciences or an equivalent qualification from a recognized university or tertiary institution.

Program fee

The program fee is HK$120,000 for 30 credits.

Curriculum

Students are required to complete 30 credits, including:

- 15 credits of financial mathematics courses;
- 9 credits of statistics courses; and
- 6 credits of free electives* and/or MAFS 6100 Independent Project#.

Financial Mathematics Course List

MAFS	5030	Quantitative Modeling of Derivatives Securities
MAFS	5040	Quantitative Methods for Fixed-income Instruments
MAFS	5210	Mathematical Models of Investment
MAFS	5230	Advanced Credit Risk Models
MAFS	5240	Software Development with C++ for Quantitative Finance
MAFS	5250	Computational Methods for Pricing Structural Products
MAFS	6010	Special Topics in Financial Mathematics
MATH	5311	Advanced Numerical Methods I
MATH	5510	Mathematics Models of Financial Derivatives
MATH	5520	Interest Rate Models

Statistics Course List

MAFS	5010	Stochastic Calculus
MAFS	5020	Advanced Probability and Statistics
MAFS	5110	Advanced Data Analysis with Statistical Programming
MAFS	5120	Applied Multivariate Analysis
MAFS	5130	Quantitative Analysis of Financial Time Series
MAFS	5220	Quantitative and Statistical Risk Analysis
MATH	5411	Advanced Probability Theory I
MATH	5431	Advanced Mathematical Statistics I

Credit transfer may be granted to students in recognition of studies satisfactorily completed in other universities or tertiary institutions. Applications must be made to the Department in the first term of study after admission. All credit transfer must be approved by the Program Director and is subject to University regulations governing credit transfer.

Graduation Requirements

Students must complete the program with a graduation grade average (GGA) of 2.850 or above as required of all postgraduate students at the University.

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* *Free electives can be any mathematics courses at 4000-level or above, or any courses outside the department at 5000-level or above.*

\# *Number of credits earned from an independent project can be 3 to 6 credits.*