

Master of Science (MSc) Program in Financial Mathematics

Program Director:

Yue-Kuen KWOK, Professor of Mathematics

The Master of Science (MSc) program in Financial Mathematics aims to prepare students from quantitative disciplines for contemporary finance and wealth management. The curriculum includes mathematical, statistical and computational methods for security pricing, asset allocation, speculative trading, and risk management, and offers comprehensive coverage on financial markets and valuable insights on the performance of various pricing models in market practice. This degree program upgrades students' knowledge in probability, statistics and stochastic calculus to a level beyond the bachelor's degree in mathematics, trains students with theories, tools and skills of programming for quantitative investment and risk management.

Contemporary financial industry is featured by the extensive use of mathematical models for security pricing, dynamical asset allocation, high-frequency trading and quantitative risk analysis. Graduates from this program are well prepared for jobs in trading and market making of derivatives, financial product development (structured products, insurance products etc.), investment decision making (fund management, trading, speculation strategies, etc.), and risk management (risk assessment, stress testing, etc.).

Program Learning Outcomes

On successful completion of the program, graduates will be able to:

- Design and evaluate quantitative models for derivatives pricing, portfolio management and trading strategies;
- Formulate appropriate risk monitoring procedures in financial transactions and perform effective scenario simulation using statistical techniques in risk assessment;
- Devise computer systems for analysis of financial data and design numerical methods for calibration of model parameters from market data;
- Make appraisal of dynamics of financial markets and formulate quantitative strategies to seek investment opportunities in fund management; and
- Analyze problems from finance in quantitative terms and develop strategies for effective solution of the problems.

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 Duration

The normal period for completing the program is 1.5 years in full-time mode and 3 years in part-time mode.

Program Fee

The program fee is HK\$180,000 for 36 credits.

Curriculum

Students are required to complete 36 credits, including:

- 18 credits of financial mathematics courses;
- 9 credits of statistics courses; and
- 9 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 5260	Building Financial Applications with Java and VBA
MAFS 5270	Mathematical Market Microstructure
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 5130	Quantitative Analysis of Financial Time Series
MAFS 5140	Statistical Methods in Quantitative Finance
MAFS 5220	Quantitative and Statistical Risk Analysis
MATH 5411	Advanced Probability Theory I
MATH 5431	Advanced Mathematical Statistics I

* *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.

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.