Master of Science Program in Financial Mathematics  
(Cohort 2019/20)

ABOUT THE PROGRAM

Financial mathematics, the application of mathematical solutions to problems in finance, is an amalgam of mathematics, statistics, finance theory and computer science. As the discipline brings efficiency and rigor to financial markets, instruments and the investment process, it has become increasingly important in regulatory concern. The MSc program focuses on preparing students to be professionals in contemporary finance and wealth management. The curriculum is continuously enhanced with relevant and up-to-date courses in quantitative finance, offering new courses in machine learning, Blockchain technology, and algorithm trading, among others, to connect to the rapid changes in the regional markets. On completion of the program, students are expected to have comprehensive knowledge of financial products, solid understanding in risk management and trading strategy, and the ability to construct and apply quantitative models.

The curriculum, with comprehensive coverage of financial markets and an emphasis on linking theory with real world developments, includes:

- Mathematical, statistical and computational methods for security pricing, asset allocation, speculative trading, and risk management;
- Valuable insight on the performance of various pricing models;
- Option pricing theory, portfolio theory, risk models, time series analysis of financial data, financial economics, and computer programming;
- Programming skills, data science techniques in statistics, machine learning and AI, and innovative financial technology.

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.
PROGRAM DURATION

The normal period for completing the program is one and a half years in full-time mode and three years in part-time mode. The normal course load is 12 credits per regular semester for full-time students with a minimum study load of 9 credits, and 6 credits per semester for part-time students. Regular semester refers to the Fall and the Spring semester of an academic year. For part-time students, the maximum load is 8 credits per semester.

PROGRAM FEE

The program fee is HK$210,000 for 36 credits.

CURRICULUM ¹

1. **Minimum Credit Requirement**
   Students are required to complete 36 credit units, including:
   1) At least 27 credits taken from the list of MAFM courses (refer to Section 2);
   2) And up to 9 credits of Elective courses (refer to Section 3).

2. **MAFM Courses** (Credit for each course: 3 units)
   At least 27 credits from the list:
   - MAFS 5010  Stochastic Calculus
   - MAFS 5020  Advanced Probability and Statistics
   - MAFS 5030  Quantitative Modeling of Derivatives Securities
   - MAFS 5040  Quantitative Methods for Fixed-Income Instruments
   - MAFS 5110  Advanced Data Analysis with Statistical Programming
   - MAFS 5130  Quantitative Analysis of Financial Time Series
   - MAFS 5140  Statistical Methods in Quantitative Finance
   - MAFS 5210  Mathematical Models of Investment
   - MAFS 5220  Quantitative and Statistical Risk Analysis
   - MAFS 5230  Advanced Credit Risk Models
   - MAFS 5240  Software Development with C++ for Quantitative Finance
   - MAFS 5250  Computational Methods for Pricing Structured Products
   - MAFS 5260  Building Financial Applications with Java and VBA

¹ Course availability and schedule vary year from year. Courses to be offered are subject to change, refer to “class schedule and quota” published by ARR for the confirmed list. Program and course catalog is available at [https://prog-crs.ust.hk/pgcourse/2019-20/MAFS](https://prog-crs.ust.hk/pgcourse/2019-20/MAFS)
MAFS 5270  Mathematical Market Microstructure
MAFS 6010  Special Topics in Financial Mathematics (A Course Series)
  o MAFS 6010L - China Financial Markets
  o MAFS 6010N - Structured Products and Solutions
  o MAFS 6010P - Distributed Ledger Technology and Financial Applications
  o MAFS 6010Q - Capstone Project in Financial Mathematics
  o MAFS 6010R - Portfolio Optimization with R
  o MAFS 6010S - Machine Learning and its Applications
  o MAFS 6010T - Capstone Project II in Financial Mathematics
  o MAFS 6010U - Artificial Intelligence in Finance
  o MAFS 6010V - Natural Language Processing
  o MAFS 6010W - Computing for Finance in Python
  o Other courses offered in the series

MATH 5311  Advanced Numerical Methods I
MATH 5520  Interest Rate Models

3. Elective Courses
   Up to 9 credits of the following:
   1) A maximum of 6 credits from MAFS6100 Independent Project can be counted
toward graduation (Credit for each project: 3 units);
      • MAFS6100A  Independent Project (offered in Fall 2019-20)
      • MAFS6100B  Independent Project (offered in Spring 2019-20)
      • MAFS6100C  Independent Project (offered in Summer 2019-20)

This course involves completion of an independent project under the
supervisor of a faculty in financial mathematics or statistics.
Scope may include:
   • identifying a non-reference problem and proposing the methods of
     solution;
   • acquiring a specific research skill.

Note: Prior discussion with a supervisor is required.

2) Other courses offered by the department of mathematics at 4000-level or
   above (but a maximum of 6 credits of 4000-level courses);
3) Courses outside the department of mathematics at 5000-level or above.

4. Remarks:
1) **Course substitution** may be granted if the student can provide evidence, such as a transcript and course syllabus, that a course is equivalent in content and level to another course taken elsewhere, for which a satisfactory grade has been obtained.

2) **Credit transfer** may be granted to students in recognition of studies satisfactorily completed in other universities or tertiary institutions. Credits previously used to satisfy the requirements of other academic qualifications cannot be transferred. **Applications must be made to the Department in the first term of study after admission**, and the credits must not be pre 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.

**FURTHER INFORMATION**

- Program website: [http://mafm.ust.hk/](http://mafm.ust.hk/)
  - In particular, application forms during you study: [http://arr.ust.hk/reg/in/in_forms/forms_std_student/forms_std_student.html](http://arr.ust.hk/reg/in/in_forms/forms_std_student/forms_std_student.html)
  - Application forms for provisional certificate and diploma collection: [https://arr.ust.hk/reg/in/in_forms/forms_alumni.html](https://arr.ust.hk/reg/in/in_forms/forms_alumni.html)
- Student Information System: [http://sis.ust.hk/](http://sis.ust.hk/)
- Canvas – the eLearning System: [https://canvas.ust.hk/](https://canvas.ust.hk/)
  - In particular, course substitution: [https://www.math.ust.hk/intranet/pg/?c=pg&f=20190830092846_Course%20Substitution_gr-27.pdf](https://www.math.ust.hk/intranet/pg/?c=pg&f=20190830092846_Course%20Substitution_gr-27.pdf)
  - Credit transfer:
Internship/Employment:

Regarding the internship endorsement, please submit the following documents to our program office for approval:

1) A completed NLSE Form A

2) A completed TPg Employment Form

3) Appointment letter or contract issued by the company (indicating job descriptions/responsibilities of the internship position and working hours)

4) A copy of NOL issued by the Hong Kong Immigration Department to all Non-local students when they first entered the territory

5) Course enrollment plan during the internship period. Please quote the Course Codes and Course Schedule

6) A copy of academic transcript (download from SIS)

Remark: It takes at least 1-2 weeks for School and PGSO to review the application.