MATHEMATICS IN FINANCE (MS)

Department Website (http://math.nyu.edu)

NYSED: 20929 **HEGIS:** 1799.00 **CIP:** 27.0305

Program Description

The Department of Mathematics is part of the Courant Institute of Mathematical Sciences (https://cims.nyu.edu/), an independent division of New York University (https://www.nyu.edu/). Based in Warren Weaver Hall, at the heart of New York University's Washington Square campus, it is one of the top-ranked Mathematics departments worldwide (#4 in the US and #9 in the world as per the Shanghai rankings (https://www.shanghairanking.com/rankings/gras/2022/RS0101/); #6 in the US and #8 in the world as per the QS rankings (https://www.topuniversities.com/university-rankings/university-subject-rankings/2022/mathematics/)).

The Master's degree in mathematics encompasses the basic graduate curriculum in mathematics, and also offers the opportunity of some more specialized training in an area of interest. A typical Master's course of study will involve basic courses in real analysis, complex analysis and linear algebra, followed by other fundamental courses such as probability, scientific computing, and differential equations. Depending on their mathematical interests, students will then be able to take more advanced graduate courses in pure and applied mathematics.

Dual Degree

The Mathematics in Finance Department offers a dual degree with the NYU Stern School of Business: (https://www.stern.nyu.edu/programs-admissions/mba-programs/dual-degrees/mba-ms-in-mathematics/) Mathematics in Finance MS/Master of Business Administration.

See Mathematics in Finance (https://gsas.nyu.edu/admissions/arc/programs/mathematics-in-finance.html) for admission requirements and instructions specific to this program.

Admissions

All applicants to the Graduate School of Arts and Science (GSAS) are required to submit the general application requirements (https://gsas.nyu.edu/nyu-as/gsas/admissions/arc.html), which include:

- Academic Transcripts (https://gsas.nyu.edu/nyu-as/gsas/admissions/arc/academic-transcripts.html)
- Test Scores (https://gsas.nyu.edu/nyu-as/gsas/admissions/arc/test-scores.html) (if required)
- Applicant Statements (https://gsas.nyu.edu/nyu-as/gsas/admissions/arc/statements.html)
- Résumé or Curriculum Vitae
- Letters of Recommendation (https://gsas.nyu.edu/nyu-as/gsas/admissions/arc/letters-of-recommendation.html), and
- A non-refundable application fee (https://gsas.nyu.edu/admissions/arc.html#fee).

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Program Requirements

Course	Title	Credits
Major Requirements		
MATH-GA 2791	Financial Securities and Markets	3
MATH-GA 2903	Stochastic Calculus	1.5
MATH-GA 2070	Data Science & Data-Driven Modeling	1.5
MATH-GA 2793	Dynamic Asset Pricing	1.5
MATH-GA 2071	Machine Learning & Computational Statistics	1.5
MATH-GA 2043 or MATH-GA 2048	Scientific Computing Scientific Computing in Finance	3
MATH-GA 2751	Risk and Portfolio Management	3
MATH-GA 2041	Computing in Finance	3
MATH-GA 2755	Project & Presentation	3
Electives		
Other Elective Credits		15
Total Credits		**36**

Additional Program Requirements

Master's Project

Students complete their Master's Project in the "Project & Presentation" course. They conduct research in smaller groups (2-3 students), supervised by faculty, adjunct faculty members, and/or subject matter experts in the financial industry. Students produce a written report (Master's thesis) and give a final presentation; each contributing equally to their final grade.

Sample Plan of Study

Course	Title	Credits
1st Semester/Term		
MATH-GA 2041	Computing in Finance	3
MATH-GA 2070	Data Science & Data-Driven Modeling	1.5
MATH-GA 2791	Financial Securities and Markets	3
MATH-GA 2751	Risk and Portfolio Management	3
MATH-GA 2903	Stochastic Calculus	1.5
	Credits	12
2nd Semester/Term		
MATH-GA 2048	Scientific Computing in Finance	3
MATH-GA 2071	Machine Learning & Computational Statistics	1.5
MATH-GA 2793	Dynamic Asset Pricing	1.5
Other Elective Credits		6
	Credits	12
3rd Semester/Term		
MATH-GA 2755	Project & Presentation	3
Other Elective Credits		9
	Credits	12
	Total Credits	**36**

Learning Outcomes

Upon successful completion of the program, graduates will have acquired:

1. Development of computer software skills, including facility with a high- level language such as Python, and the ability to work with financial databases.

2. Development of mathematical skills, including the tools from probability, statistics, and scientific computing that are most useful in quantitative finance.
3. Development of a broad understanding of financial markets and the many investment instruments they encompass.
4. Development of familiarity with widely-used financial models for pricing, hedging, risk-management, asset allocation, and other applications of quantitative finance. This includes understanding the models' hypotheses and limitations.
5. Acquisition of specialized skills associated with selected quantitative career paths; examples of such skills include algorithmic trading, statistical arbitrage, and financial machine learning.
6. Acquisition of "soft skills" that are crucial for placement and career advancement, including the ability to network effectively, the ability to interview well, and the ability to work well as part of a team.

Policies
NYU Policies

University-wide policies can be found on the New York University Policy pages (https://bulletins.nyu.edu/nyu/policies/).

Graduate School of Arts and Science Policies

Academic Policies for the Graduate School of Arts and Science can be found on the Academic Policies page (https://bulletins.nyu.edu/graduate/arts-science/academic-policies/).