



College of Humanities  
and Sciences

# Quantitative Finance

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Quantitative Finance in  
NUS

OPEN  
HOUSE

13TH  
MAY  
2023

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# Quantitative Finance in NUS

The Department of Mathematics offers three undergraduate programmes related to Quantitative Finance (QF):

- Major in Quantitative Finance
- Second Major in Quantitative Finance
- Minor in Quantitative Finance

Admission requirements: A good H2 pass (or equivalent) in Mathematics.

# Major in Quantitative Finance

The Major in QF is designed for students who wish to work in the finance industry as a quantitative analyst (quant), risk analyst or other job roles involving the application of quantitative tools to financial applications.

The majority of our QF graduates found jobs in banking and finance industries, both locally and globally.

## Job Scope:

- Financial Product Development and Pricing (e.g. Structured Deposits, Exotic Derivatives)
- Risk Management
- Investment Decision Making and Fund Management
- Wealth Management

The Major in QF is a multidisciplinary programme which combines mathematics, finance and computing with a practical orientation.

The 60-unit curriculum covers

- mathematical theory and tools;
- statistical tools;
- computing theory and techniques;
- financial theory and principles and
- core financial product knowledge.

Course Level	Major Requirements	Level Units	Cumulative Units
1000	1. QF1100 Introduction to Quantitative Finance	4	4
2000	2. Pass all the following: <ul style="list-style-type: none"> <li>MA2001 Linear Algebra I</li> <li>MA2002 Calculus</li> <li>MA2116/ST2131 Probability</li> <li>MA2213 Numerical Analysis I or DSA2102 Essential Data Analytics Tools: Numerical Computation</li> <li>QF2103 Computing for Quantitative Finance</li> <li>QF2104 Fundamentals of Quantitative Finance</li> </ul>	28	32
3000	3. Pass all the following: <ul style="list-style-type: none"> <li>QF3101 Investment Instruments and Risk Management</li> <li>QF3103 Advanced Mathematics in Quantitative Finance</li> <li>ST3131 Regression Analysis</li> </ul>	12	44
4000	4. Pass all the following: <ul style="list-style-type: none"> <li>QF4102 Financial Modelling and Computation</li> <li>QF4103 Mathematical Models of Financial Derivatives</li> <li>QF4104 Project in Quantitative Finance and Fintech</li> </ul> 5. Pass <b>one</b> from the following: <ul style="list-style-type: none"> <li>QF4211/DSE4211 Digital Currencies</li> <li>QF4212/DSE4212 Data Science in FinTech</li> <li>QF4205 Time Series Analysis for Quantitative Finance</li> </ul>	16	60

# Second Major in Quantitative Finance

The Second Major in QF offers students reading other primary major in NUS an opportunity to broaden their knowledge base with theory and applications in quantitative finance, thereby increasing their employability in jobs which require additional knowledge on quantitative aspects of finance-related matters beyond his/her primary job functions.

Course Level	Second Major Requirements	Level Units	Cumulative Units
1000	1. QF1100 Introduction to Quantitative Finance	4	4
2000	2. Pass 8 Units from courses coded MA15xx/MA20xx/MA2101/MA2101S/MA2108/MA2108S 3. Pass all the following: <ul style="list-style-type: none"> <li>• MA2104 Multivariable Calculus or MA2311 Techniques in Advanced Calculus or ME3291 Numerical Methods in Engineering</li> <li>• MA2116/ST2131 Probability or EC2303 Foundation of Econometrics or ST2334 Probability and Statistics or MA2301 Basic Applied Mathematics</li> <li>• QF2103 Computing for Quantitative Finance</li> <li>• QF2104 Fundamentals of Quantitative Finance</li> </ul>	24	28
3000	4. Pass <b>three</b> from the following: <ul style="list-style-type: none"> <li>• QF3101 Investment Instrument and Risk Management</li> <li>• QF3103 Advanced Mathematics in Quantitative Finance</li> <li>• QF4102 Financial Modelling and Computation</li> <li>• QF4103 Mathematical Models of Financial Derivatives</li> <li>• ST3131 Regression Analysis</li> <li>• EC3303 Econometrics I</li> <li>• FIN3702 Investment Analysis and Portfolio Management</li> <li>• FIN3716 Financial Modelling</li> </ul>	12	40



# Minor in Quantitative Finance

The Minor in QF provides students from other Primary/Second Majors exposure to basic concepts and theories to solve problems in the financial industry.

The minor also provides a possible path to upgrade to the second major in Quantitative Finance.

The QF minor requirements follow a two-track structure for different groups of students.

## Track 1

For students with a primary major in FOS (only MA, DSA, DSE, ST majors), CDE (all Engineering majors), SOC (all majors), or is reading a second major in MA, DA, ST, BZA, or has passed a course in the linear algebra group (MA2001/MA1508E/MA1513/MA1522) and calculus group (MA2002/MA1312/MA1505/MA1507/MA1511/MA1521).

Course Level	Minor Requirements	Level Units	Cumulative Units
1000	1. QF1100 Introduction to Quantitative Finance	4	4
2000	2. ST2334 Probability and Statistics or (MA2001 Linear Algebra or MA1508E Linear Algebra for Engineering or MA1513 Linear Algebra with Differential Equations or MA1522 Linear Algebra for Computing) 3. QF2104 Fundamentals of Quantitative Finance	8	12
3000	4. QF3101 Investment Instrument and Risk Management 5. Pass <b>one</b> of the following: <ul style="list-style-type: none"><li>• QF3103 Advanced Mathematics in Quantitative Finance</li><li>• ST3131 Regression Analysis</li><li>• EC3303 Econometrics I</li><li>• FIN3702 Investment Analysis and Portfolio Management</li><li>• FIN3716 Financial Modelling</li></ul>	8	20

## Track 2

For all other students not covered by track 1.

Course Level	Minor Requirements	Level Units	Cumulative Units
1000	1. QF1100 Introduction to Quantitative Finance	4	4
2000	2. MA2301 Basic Applied Mathematics* 3. QF2104 Fundamentals of Quantitative Finance	8	12
3000	4. QF3101 Investment Instrument and Risk Management 5. Pass <b>one</b> of the following: <ul style="list-style-type: none"><li>• QF3103 Advanced Mathematics in Quantitative Finance</li><li>• ST3131 Regression Analysis</li><li>• EC3303 Econometrics I</li><li>• FIN3702 Investment Analysis and Portfolio Management</li><li>• FIN3716 Financial Modelling</li></ul>	8	20

\*MA2301 can be replaced by three courses, with one course in each of the areas of calculus, linear algebra and probability, as follows:

Calculus	Linear Algebra	Probability
MA1102R/MA2002 Calculus	MA2001 Linear Algebra I	MA2216/MA2116/ST2131 Probability
MA1312 Calculus with Applications	MA1508E Linear Algebra for Engineering	ST2334 Probability and Statistics
MA1505 Mathematics I	MA1513 Linear Algebra with Differential Equations	
MA1507 Advanced Calculus	MA1522 Linear Algebra for Computing	
MA1511 Engineering Calculus		
MA1521 Calculus for Computing		