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Msc Mathematics and Finance
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MSc in Mathematics and Finance

Imperial College London, 2025-2026

Summer Reading List

Congratulations on joining the MSc in Mathematics and Finance at Imperial College London this September. We look forward to welcoming you here! It will be a busy and exciting academic year, where you will need to juggle between lectures, homeworks, interviews and it is never too early to prepare for it. The following aims at helping you prepare for this in the best possible way.

The academic contents of the MSc in Mathematics and Finance are both highly theoretical and fully practical, combining technical modules in Mathematics (analysis, stochastic processes, numerical methods, Statistics, data analysis, machine learning, quantum computing) as well as Finance-oriented topics (option pricing, algorithmic trading, risk management, interest rates, market microstructure, volatility modelling). Many modules incorporate some coding component, and a strong knowledge of programming is necessary to obtain the degree. To help you prepare as optimally as possible, we recommend that you get familiar with the following reading list.

Mathematics

The Imperial College MSc in Mathematical Finance is both highly theoretical and very practical. The theoretical aspects rely on a strong background in Mathematics, with a particular focus on Analysis and Probability. The main references for the Analysis background are

- W. Rudin, *Principles of Mathematical Analysis* (McGraw-Hill, 1976)
- G.B. Folland, *Real analysis, modern techniques and their applications* (John Wiley & Sons, 1984)

Rudin's book should be part of your Undergraduate background. Folland's monograph goes deeper in Analysis, covering Functional Analysis and some elements of Measure Theory.

For background on Probability and Statistics, you should look at

- J. Jacod, P. Protter, *Probability essentials* (Springer, 2004)
- L. Wasserman, *All of Statistics: A Concise Course in Statistical Inference* (Springer, 2010)

Partial Differential Equations are also fundamental in Mathematical Finance, and we highly recommend the following book for a review on the topic (at least Part 1):

- Duffy, *Finite Difference Methods in Financial Engineering- a PDE approach* (Wiley, 2006)

We highly recommend you familiarise yourself (or refresh your memories) with these topics. They will be widely covered and analysed in the MSc and some familiarity with them will definitely be an advantage.

Finance

Even though the underlying tools of quantitative analysis in banks, hedge funds and FinTech are highly mathematical, one should not lose track of the surrounding contexts and objectives. Standard (non-mathematical) books about options derivatives are

- J. Hull, *Options, Futures, and Other Derivatives* (Prentice Hall, 2005).
- M. Joshi, *The Concepts and Practice of Mathematical Finance* (CUP, 2008).

If you wish to learn about the history and the making of quantitative finance, we recommend the following easy-to-read novels, albeit to take with a pinch of critical mind:

- A. Admati, M. Hellwig, *The banker's new clothes* (Princeton University Press, 2014)
- S. Patterson, *The Quants, the Maths geniuses who brought down Wall Street*
- M. Lewis, *Liar's Poker* (Hodder Paperbacks, 2006)
- M. Lewis, *Flash Boys* (Penguin, 2015)
- G. Zuckerman, *The Man Who Solved the Market (*Portfolio, 2019*)*

Internet also contains a lot of information, and the following videos will get you familiar with quantitative finance:

- [Money & Speed: Inside the Black box](#) (documentary about the 2010 Flash Crash)
- [Quants | The Alchemists of Wall Street](#)
- Interview with Marco Avellaneda: '[The era of the pure quant is over](#)'
- [An interview with Jim Simons](#), the founder of Renaissance Technologies
- A.E. Khandani, A.W. Lo: [What happened to the Quants in August 2007?](#)

The following websites should also be checked regularly:

- [Bloomberg](#) is a financial software company providing analytics, Equity trading platform, data services, and news to financial companies.
- The [Financial Times](#) is one of the main newspapers regarding business and economics.

Coding

Coding is an essential part of the daily task of quantitative analysts and data scientists, and C++ has historically been the main language in the financial industry. While we will teach you C++, it is highly recommended that you acquire preliminary notions. A good reference to start is

B. Stroustrup (designer of C++), *Programming: Principles and Practice Using C++*

Aside from C++, Python has become an essential language in the (financial) industry; it is open source, interpreted, high-level, multipurpose and cross-platform. It also allows easy manipulation of data (with direct imports from Yahoo Finance or Google for example), an essential feature in the current Big Data context. Several modules in the MSc programme use Python, and we strongly recommend you have a first look at it. Full details about the language itself are available at www.python.org, and we recommend you install everything through www.anaconda.com. A good reference in the context of Finance is

Y. Hilpisch, *Python for Finance: Analyze Big Financial Data*.

There are of course many other useful programming languages and computing environment (R, C#, Java, MATLAB, S+, Q, KDB), but a large part of the financial industry (banks, hedge funds, regulators) seem to be now shifting towards a combination of C++ for speed and Python for ease of use and compatibility and for its wide-ranging libraries.

At the interface between Computing, Mathematics and Statistics, Machine Learning has become an essential tool in the financial industry, and a good overview is available at

OECD (2021), *Artificial Intelligence, Machine Learning and Big Data in Finance*

Interview Preparation

Soon after joining the programme (and potentially even before), you will need to start applying to internships in the Finance industry (and in most cases be invited to interviews). Interviews need to be prepared thoroughly. While every place / every group may have their questions, technical or not, you should do your best to get ready for them. Obviously a strong knowledge in Mathematics, Statistics, Finance and Computing is an absolute pre-requisite, practicing typical questions is essential. The following (non-exhaustive) resources should help you prepare for this new exercise:

- https://quantnet.com/threads/big-list-of-quant-interview-questions-with-answers.36240/

- https://www.streetofwalls.com/finance-training-courses/quantitative-hedge-fund-training/quant-interview-questions-answers/

- https://www.interviewquery.com/p/quant-interview-questions

- https://openquant.co/questions

- https://www.efinancialcareers.com/news/2018/05/quant-interview-questions-finance

Other activities during the year

Apart from lectures, coursework and exams, your academic year at Imperial College will be filled with weekly Practitioners' Lectures (Tuesdays 6pm-7.30pm), weekly Careers in Quantitative Finance (Wednesdays 6pm-8pm), and research seminars, which are essential for you to acquire an open-minded view of the Finance industry.

Looking forward to having you here very soon,

Dr Eyal Neuman and Dr Yufei Zhang
Co-Directors, MSc in Mathematics and Finance