



AIFMRM

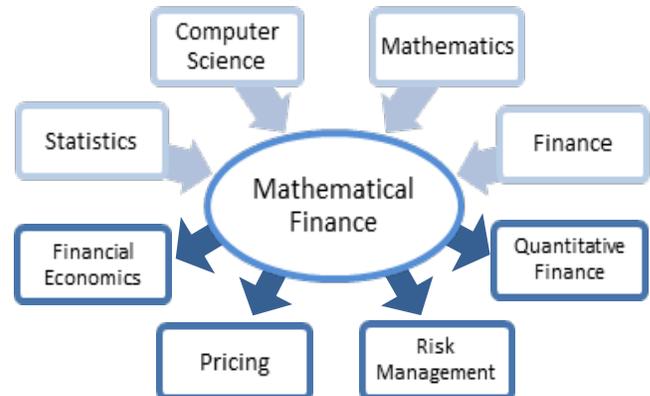
AFRICAN INSTITUTE OF FINANCIAL MARKETS AND RISK MANAGEMENT



Frequently Asked Questions about [Mathematical Finance](#) at UCT

What is Mathematical Finance?

Mathematical Finance is the application of mathematical, computational and statistical tools to the pricing of assets, liabilities and derivatives in a modern, interdependent and complex financial market. Mathematical Finance is also a basis for practice and research in Risk Management, Financial Engineering and Quantitative Finance.



Why would I do a Mathematical Finance degree?

The overwhelming reason to do any Master's degree is to expose you to new knowledge and thereby expand your education and employment opportunities. The MPhil in Mathematical Finance at UCT is primarily a professional degree, so it seeks to prepare graduates for a challenging career in financial services. However, it is rigorous enough to facilitate PhD studies after the degree.

Among others, Mathematical Finance graduates are employed at:

- Standard Bank
- Rand Merchant Bank
- FirstRand
- Old Mutual
- Liberty
- ABSA-Barclays
- Nedbank
- Sanlam
- Investec
- Deutsche Bank
- Goldman Sachs
- UCT
- Deloitte
- BlackRock
- Uber
- Discovery

What careers does a degree in Mathematical Finance lead to?

Traditionally, Mathematical Finance graduates *were* almost exclusively employed in quantitative roles at investment and retail banks. Since the crisis of 2007/8, this has changed dramatically. The pricing and hedging of risk has converged in methodology across most of the financial services, and today graduates also find themselves employed in general and health insurance companies, pension funds, asset management firms, financial consultancies and accounting practices.

There are further employment opportunities in assorted service providers such as software companies, financial data providers, financial research units, financial media, regulatory authorities, and at securities exchanges. Because of the extreme scarcity of skills in this field, there is almost no limit to the opportunities available to a graduate who wants to work in the financial services industry and its allied network.

What are the pre-requisites for students to do Mathematical Finance degrees?

The financial services industry is keen to employ graduates from diverse backgrounds since this brings a variety of opinions, approaches and skills into their organisations. Almost any quantitative (mathematical) background is sufficient to tackle mathematical finance. Students come from engineering, pure mathematics, applied mathematics, statistics, physics and computer science undergraduate degrees. However, most of the mathematical finance graduates in South Africa begin their university career studying Actuarial Science (including Quantitative Finance). The primary (but not exclusive) selection criterion is past academic performance.

Why would I do this as an Actuarial Science graduate?

In many ways, mathematical finance is an extension of the concepts learned during an actuarial science undergraduate degree, particularly in the areas of finance and investments. The problem-solving style encouraged by an actuarial training is easily extended to this field. The MPhil can then enhance the diversity of opportunities available to you by opening up the area of financial services.

The MPhil in Mathematical Finance at UCT

The MPhil in Mathematical Finance at UCT is convened in the [African Institute of Financial Markets & Risk Management](#) in the Faculty of Commerce by Dr Alex Backwell. The degree is by coursework and minor dissertation and can be completed over one year. It is a full-time degree, and does not offer a part-time option. The coursework is split evenly over the semesters and is taught by AIFMRM academics and practitioners from the financial services industry. Four of the staff members have postgraduate degrees in mathematical finance.

The MPhil is primarily an applied mathematics degree and *not* a finance qualification. However, to prevent separation between the theory and the practice, it is crucial to relate the mathematics to the financial context in which it is applied. Consequently, it is sometimes referred to as financial economics or financial engineering. At UCT, we regard it as a field of applied mathematics and applied statistics.

The MPhil in Mathematical Finance allies itself with the research work in AIFMRM. Students are therefore exposed to current developments in quantitative finance research. Additionally, students get to interact with the visiting academics and financial institutions that work alongside AIFMRM. Thus, there is a natural merger of academic content with the research and practice of mathematical finance.

What can I expect during the degree?

The MPhil degree at UCT offers a comprehensive and rigorous introduction to the techniques and tools of financial mathematics. Courses cover a diversity of areas, but are concentrated on three themes: Practical Knowledge of financial markets, Theoretical Knowledge of the necessary mathematics and modelling techniques, and Computational Skills for the implementation of the mathematics in a financial framework. In many cases, the dissertation is completed with supervisory assistance from a financial services practitioner. A complete breakdown of the degree structure can be found in the Faculty of Commerce Postgraduate Studies Handbook.

What if I have no background in Finance, Statistics or Computer Science?

The programme begins with an intensive set of introductory courses that cover the background knowledge necessary for the degree. There are three introductory courses that cover statistics, finance and mathematical computing. These courses provide compressed and focused training in their respective disciplines so that students are well equipped for the main coursework content of the degree. The introductory courses commence mid-January each year. A pre-reading syllabus is also available.

Is there funding available for MPhil students?

Unfortunately, we cannot guarantee funding for the degree. However, AIFMRM is financially supported by Nedbank, Old Mutual, ABSA, FirstRand, Standard Bank, Sanlam and Rand Merchant Bank. Some of the funding is used to buy in the teaching skills and knowledge of practitioners and to enhance the experience of the students. A number of company bursaries or scholarships are *exclusively* available to students doing the MPhil. Application for these is made after acceptance into the programme. In addition, funding is available from UCT, with many students receiving scholarships based on need or merit.

In recent years we have been successful in receiving dedicated bursaries with no-strings-attached from BankSETA. We will make application for these every year that they remain available.

If you have any questions relating to the degree, **please contact the convenor:**

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Developing the minds that **shape** the financial industry to advance society

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AIFMRM and the MPhil are supported by:

