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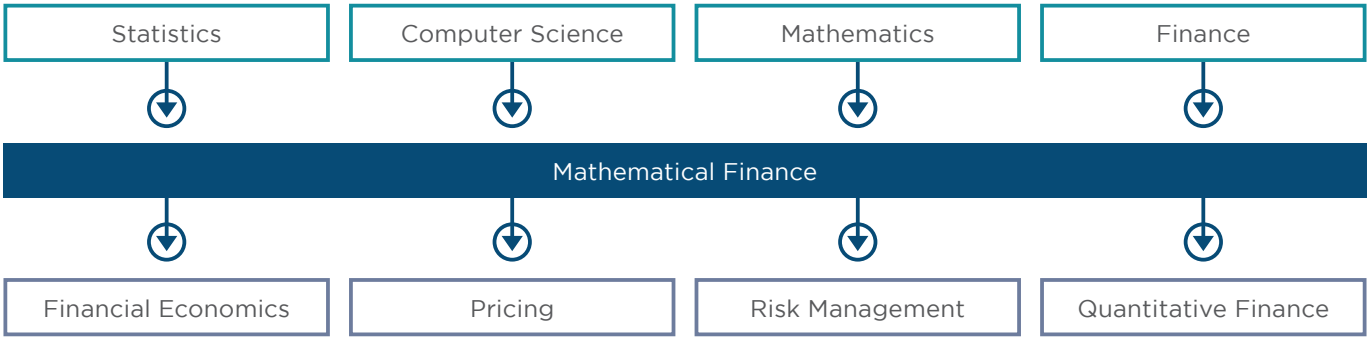
Frequently Asked Questions about Mathematical Finance at UCT

What is Financial Engineering?

Financial Engineering refers to the application of mathematical, statistical and computational tools in the context of modern financial markets. The core focus is the pricing and management of assets, liabilities, derivatives, and their associated risks, in a complicated and interdependent environment. This involves the rigorous implementation of the more mathematical/quantitative branches of financial theory.

Why would I do a Financial Engineering 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 Master of Financial Engineering (MFE) 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.



What careers does a degree in Financial Engineering lead to?

Traditionally, graduates in financial engineering/ quantitative finance 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 have 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 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 a Financial Engineering degree?

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 financial engineering. Students come from engineering, pure mathematics, applied mathematics, statistics, physics and computer science undergraduate degrees. However, in South Africa, a significant portion of Financial Engineering graduates begin their university careers studying Actuarial Science. 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 actuarial training is easily extended to this field. The MFE can then enhance the range of opportunities available to you, particularly in financial services.

The Master of Financial Engineering at UCT

The MFE at UCT is convened in the **African Institute of Financial Markets and Risk Management** (AIFMRM) in the Faculty of Commerce. The degree runs over one calendar year, starting with preliminary courses that run prior to the two main semesters. The coursework is taught primarily by AIFMRM academics, with some contributions from practitioners in financial services. One quarter of the degree's credits are dedicated to research, where modern research in financial engineering and quantitative finance will be introduced and engaged. The MFE is a full-time degree and does not offer a part-time option. Further details about the courses that comprise the MFE can be found on the **MFE webpage**.

The MFE allies itself with **AIFMRM's research**, undertaken by AIFMRM staff and their academic collaborators. Students are exposed to current developments in quantitative finance research through the weekly AIFMRM research seminar and the annual Financial Mathematics Team Challenge (FMTC). MFE students interact with the visiting academics and financial institutions that work alongside AIFMRM. Thus, there is a natural merger between the academic and industrial faces of financial engineering. The link between AIFMRM's teaching and research is instrumental in enabling MFE graduates to pursue PhD studies.

What can I expect during the degree?

The MFE 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. The research component of the degree involves the synthesis of these skills in novel, challenging contexts. A complete breakdown of the degree structure can be found in the **Faculty of Commerce Postgraduate Studies Handbook**.

How does the MFE differ from the previous MPhil in Mathematical Finance?

The MFE has replaced the MPhil in Mathematical Finance that AIFMRM previously offered. The MPhil ran for ten highly successful years, garnering an increasing national and international reputation; the MFE is largely a continuation of this tradition. The general teaching approach and key individuals remain the same. However, the change is motivated by a number of adjustments that AIFMRM feel are necessary to maintain the stature and applicability of the degree. There is a general refreshment of the curriculum, given modern academic and industrial trends, with the inclusion of software development and machine learning electives. The research component of the degree has been adjusted to be more professionally and practically oriented.

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

The programme begins with an intensive set of preliminary courses covering the background knowledge necessary for the degree. There are three preliminary courses, respectively covering statistics, mathematical computing and finance. These courses provide compressed and focused training in their respective disciplines so that students, regardless of background, are equipped for the main coursework content of the degree. The introductory courses commence mid-January each year.

Is there funding available for MFE 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 students' experience.
A number of company bursaries or scholarships are exclusively available to students doing the MFE. 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 scholarships for South African students 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:

Prof David Taylor
AIFMRM
Room LC5.44
Leslie Commerce Building
Upper Campus
University of Cape Town
david.taylor@uct.ac.za

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AIFMRM and the MFE are supported by:

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