

BUSINESS WITH A TWIST: FINANCIAL MATHEMATICS AND ENGINEERING

Financial mathematics, engineering and computational finance lead to great careers for analytical and quantitative students, explains *Laurie Derechin* from the International Association of Financial Engineers



A growing number of universities are offering Master of Financial Mathematics (MFM), Master of Computational Finance (MSCF) and Master of Financial Engineering (MFE) programmes. The International Association of Financial

Engineers (IAFE) has a committee comprised of programme directors of MFM, MSCF and MFE programmes within the United States and Canada. A full list of programmes can be found on the Student Resources Guide on the IAFE Website – www.iafe.org

What are financial mathematics and financial engineering?

The terms Financial Mathematics and Financial Engineering are similar names for a field that combines the mathematics of probability, stochastic processes and partial differential equations along with statistics, economic theory and computer programming. Students learn how to develop financial models and analytical techniques that help a variety of financial institutions make pricing, hedging, trading and portfolio management decisions to manage risk and gain the best returns on their investments and operations.

What jobs do graduates secure?

A student who graduates from one of these programmes can go into a variety of careers: investment banking, corporate strategic planning, risk management, primary and derivative securities valuation, swaps and derivatives trading or dealing, financial information systems management, insurance, portfolio management or regulatory work.

Who hires MFM/MFE/MSCF graduates?

- Banks
- Investment banks
- Insurance companies
- Hedge funds
- Agribusiness and commodities firms
- Electronic trading boards
- Options market makers and clearing houses
- Capital management firms
- Regulatory entities that regulate and monitor the capital markets

Renowned researchers in financial mathematics and computational finance

Faculties in these programmes are engaged in breakthrough research in the field of financial mathematics and engineering. For example, Carnegie Mellon's interdisciplinary Master in Computational Finance boasts



a world-renowned academic in the field of mathematical finance, Professor Steve Shreve. He has published and co-authored many well-known books including: *Stochastic Calculus for Finance*; *Methods of Mathematical Finance*; and *Brownian Motion and Stochastic Calculus*.

Industry practitioners teach in programmes and recruit graduates

Many industry practitioners involved in the various programmes are representative of the financial sectors that are active in the cities where the programmes are located. For instance, New York University's Courant Institute of Mathematics offers a Master of Mathematical Finance in the centre of New York City, one of the world's top financial hubs, giving students direct access to top financial investment banking executives, who teach and lecture in the programme and recruit as well.

Another example is the University of Minnesota's Master in Financial Mathematics, based in Minneapolis, Minnesota - home to many worldwide insurance companies, hedge funds and agribusiness/commodities trading firms.

Industry practitioners advising, teaching and recruiting in the programme include petroleum, exotics and foreign exchange traders, insurance hedging executives and risk managers for options clearing houses.

The University of California's master's programme in Financial Engineering at Berkeley, in the Haas School of Business, is in close proximity to Silicon Valley and downtown San Francisco, the finance capital of the West Coast. The San Francisco Bay area is also a gateway to the Pacific Rim, and there is a fluid interaction between the Haas MFE programme and companies in the high growth markets of China, Singapore and Hong Kong. ...



International student body and programmes

Many international students are enrolled in MFM, MSCF and MFE programmes in North America. Each of the universities has international student centres that help students navigate the student visa process, become acclimatised to life in the USA and Canada, and process postgraduate work visas. Since the financial systems are highly developed in North America, international students attend these programmes to learn the discipline, gain experience in a mature financial market and then return to their respective countries to help develop those markets.

There are also North American universities with programmes in the emerging growth markets of Asia. For instance, the University of Chicago's Master in Financial Mathematics programme has an MFM programme based in Singapore identical to the one in Chicago.

Top notch career services and support

The variety of MFM, MCF and MFE programmes offer a wide array of career services, including customised career development and advancement coaching, workshops, networking events, weekly seminars, internships and on-going support in the job search process. All of these careers services teach students how to connect with worldwide job opportunities.

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