

MFE Program

Learning Objectives of the Program

- Graduates will be able to analyze complex problems in financial mathematics.
- Graduates will be able to evaluate and correlate stochastic processes.
- Graduates will be able to forecast stochastic events in finance and related fields as weather (hurricanes, floods, volcanoes).
- Graduates will have the computational skills to program complex stochastic processes in finance and related fields.
- Graduates will be able to apply their knowledge in the insurance, risk-management, and investment banking industry as well as in related fields.

In particular, the Financial Engineering program will address needs of commercial banks in the field of insurance and risk management. It will address the needs of international investment banks to model financial innovations as interest rate derivatives (futures, complex swaps and options), credit derivatives as Credit Default Swaps (CDS) and CDOs (collateralized debt obligations). It will also address new products in weather derivatives (temperature, hurricane and climate change modeling), as well as energy derivatives and real estate derivatives. The program is also designed to give graduating students the knowledge and skill set to create their own corporations in the fields of insurance, risk management, and modeling of stochastic processes.

Program Organization

The MFE program consists of 30 credits. The program consists of (ten) 3-credit courses. This full-time program is taught as a cohort in a one-year period starting in the Fall. As this is a very demanding program there will be no part-time students. FIN 661 (Research Seminar in Financial Engineering) will be taken last and represents the culminating experience for the program.

MFE Curriculum

Fall semester

Financial PDEs (Partial Differential Equations) and Stochastic Calculus (FIN 651)
Programming in Finance (FIN 652)
Capital Markets, Portfolio Theory and Optimization (FIN 653)
Financial Derivatives – Theory and Application (FIN 654)

Spring Semester

Financial Econometrics and Forecasting (FIN 655)
Insurance and Risk Management (FIN 656)
Interest Rate and Credit Models (FIN 657)
Stochastic Modeling in Finance and Related Fields (FIN 658)

Summer 1

Mortgage Backed Securities and Weather Derivatives (FIN 659)

Summer 2

Research Seminar in Financial Engineering (FIN 661)