Financial Mathematics (FIM)

FIM 500 Career Development for Quants (3 credit hours)
Enhance your professional and career development skills while you are in the Financial Math program with seminar topics on networking, LinkedIn, resumes, interviews, presentations and business writing tips. Learn about workplace etiquette and business ethics. You will also gain resources and important industry information from guest speakers and alumni. Become Base SAS Certified and Bloomberg Certified, and gain hands-on experience with these tools by participating in group and individual projects.Course includes one or more projects that expose students to applications in the area of financial mathematics. Students that wish to develop SAS programming skills are encouraged to take ST 555/556.

Must be in the Masters of Financial Mathematics program.
Typically offered in Fall only

FIM 528/MA 528/ECG 528 Options and Derivatives Pricing (3 credit hours)
The course covers (i) structure and operation of derivative markets, (ii) valuation of derivatives, (iii) hedging of derivatives, and (iv) applications of derivatives in areas of risk management and financial engineering. Models and pricing techniques include Black-Scholes model, binomial trees, Monte-Carlo simulation. Specific topics include simple no-arbitrage pricing relations for futures/forward contracts; put-call parity relationship; delta, gamma, and vega hedging; implied volatility and statistical properties; dynamic hedging strategies; interest-rate risk, pricing of fixed-income product; credit risk, pricing of defaultable securities.

Prerequisites: MA 341 and MA 405 and MA 421
Typically offered in Fall only

FIM 547/MA 547 Stochastic Calculus for Finance (3 credit hours)
This course explores stochastics calculus with its applications in pricing and hedging problems for financial derivatives such as options. Topics to be covered in the course include 1) discrete and continuous martingales, 2) Brownian motions and Ito's stochastic calculus, and 3) Black-Scholas framework for financial derivatives pricing and hedging.

Prerequisite: FIM 528 and MA(ST) 546
Typically offered in Spring only

FIM 548/MA 548 Monte Carlo Methods for Financial Math (3 credit hours)
Monte Carlo (MC) methods for accurate option pricing, hedging and risk management. Modeling using stochastic asset models (e.g. geometric Brownian motion) and parameter estimation. Stochastic models, including use of random number generators, random paths and discretization methods (e.g. Euler-Maruyama method), and variance reduction. Implementation using Matlab. Incorporation of the latest developments regarding MC methods and their uses in Finance.

Prerequisites: (MA 421 or ST 421), MA 341, and MA 405
Typically offered in Spring only

FIM 549/MA 549 Financial Risk Analysis (3 credit hours)
This course focuses on mathematical methods to analyze and manage risks associated with financial derivatives. Topics covered include aggregate loss distributions, extreme value theory, default probabilities, Value-at-Risk and expected shortfall, coherent risk measures, correlation and copula, applications of principle component analysis and Monte Carlo simulations in financial risk management, how to use stochastic differential equations to price financial risk derivatives, and how to back-test and stress-test models.

Prerequisites: MA 405 and (MA 421 or ST 421) and (MA/ST 412 or MA/ST 413)
Typically offered in Spring only

FIM 590 Special Topics in FIM (1-6 credit hours)
Special Topics in FIM

FIM 601 Seminar in Financial Mathematics (1 credit hours)
Seminar in Financial Mathematics

Prerequisite: FIM 500
Typically offered in Fall and Spring

FIM 610 Special Topics in Financial Mathematics (1-6 credit hours)
Special Topics in Financial Mathematics

FIM 620 Special Problems in FIM (1-6 credit hours)
Special Problems in FIM

FIM 650 Internship in Financial Mathematics (1-9 credit hours)
The internship experience provides the students the opportunity to use quantitative financial mathematics in a workplace under the supervision of a practitioner. Links academic theory to practice. Develop a heightened awareness of workplace issues as they relate to the student's chosen career path. Clarify and/or confirm professional direction. An internship or project is required of all students in the Masters of Financial Mathematics Program. Restricted to students in the Masters of Financial Mathematics.

Must be a student registered in the Masters of Financial Mathematics program.
Typically offered in Fall, Spring, and Summer

FIM 675 Project in Financial Mathematics (1-3 credit hours)
The project provides the students the opportunity to apply quantitative financial mathematics to a problem of practical interest under the supervision of faculty and/or practitioners. Links academic theory to applications. Examine a practical problem from financial mathematics using marketplace data. Approach solutions to the problem considering aspects of quantitative risk and/or optimal returns. Methods and models will be drawn from academic courses and other sources. Restricted to students in the Masters of Financial Mathematics.

Must be a student registered in the Masters of Financial Mathematics program.
Typically offered in Fall, Spring, and Summer

FIM 688 Non-Thesis Masters Continuous Registration - Half Time Registration (1 credit hours)
Non-Thesis Masters Continuous Registration - Half Time Registration

Typically offered in Spring only

FIM 689 Non-Thesis Masters Continuous Registration - Full Time Registration (3 credit hours)
Non-Thesis Masters Continuous Registration - Full Time Registration

Typically offered in Fall and Spring

FIM 693 Master's Supervised Research (1-9 credit hours)
Master's Supervised Research

Typically offered in Fall, Spring, and Summer