In today’s fast-changing financial environment, organizations look for experts who not only understand how the financial markets work, but who also possess in-depth knowledge of complex investment strategies, financial modeling skills, analytical competencies, computational expertise and practical know-how.

Financial Engineering at Stevens provides students with a fundamental understanding of domains applied in the quantification of financial systems and knowledge areas that are intrinsic in the structuring of financial products and markets. Graduates develop the analytical skills, technical competencies and managerial skills needed to impact areas such as systemic risk, portfolio optimization, high-frequency finance and financial networks.
The Master of Science in Financial Engineering is an intensive and highly focused program anchored in cutting-edge research and best practices in financial engineering. With sharply honed practical skills that are complimented by strong technical elements, the program prepares graduates for a career in industries such as investment banking, risk management, data analytics, securities trading and portfolio management.

The master's degree requires 10 courses (equivalent to 30 credits); six core required courses and four-elective courses. At least three credits and up to six credits, must be applied towards a project or thesis. For the electives, students are encouraged to take an integrated sequence leading to a graduate certificate in one of the four financial engineering focus areas. Students can choose electives in other program areas with faculty advisor approval.

### Required Core Courses
- **FE 610** Stochastic Calculus for Financial Engineers
- **FE 620** Pricing and Hedging
- **FE 621** Computational Methods in Finance
- **FE 630** Portfolio Theory and Applications
- **FE 680** Advanced Derivatives
- **FE 800** Special Problems in Financial Engineering

* FE 800 is a capstone research course that provides FE graduate students with corporate internships at leading financial institutions. Students get an opportunity to apply their recently acquired financial engineering knowledge to real world problems.

### FE Areas of Focus
- Quantitative Finance
- Financial Services Analytics
- Financial Risk & Regulation
- Financial Systems

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**DOCTORAL DEGREE**

As the first financial engineering doctoral program to be developed in the nation, the Doctor of Philosophy (Ph.D.) degree is designed to prepare students to perform high-impact research and high-level design that will contribute significantly in the advancement and growth of the field of financial engineering. The Ph.D. program consists of 54 credits, post master's. Students work alongside faculty and perform transformative research in crucial areas such as portfolio optimization, financial standards, systemic risk, behavioral finance and microstructure finance. For more details on the doctoral program and requirements, visit stevens.edu/sse/doctoral-studies.

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“The Stevens FE program is challenging, with a high ROI. The faculty is exceptional, with a great mix of academic and pragmatic experience which I believe makes the program unique.”

Saverio Minervini, Associate in Investment Banking, Nomura Master’s in Financial Engineering, 2012
The Hanlon Financial Systems Lab at Stevens Institute of Technology is a state-of-the-art financial research and teaching facility that supports programs at the undergraduate, master’s and doctoral levels. The first of its kind in the United States, the lab is where teaching and research come together to provide a contextual learning platform for developing and training future financial systems experts.

The Hanlon Lab provides faculty and students the ability to access and analyze a vast array of financial and economic data, apply enterprise-level data analytical methods, conduct interactive trading simulations and develop contemporary financial models. It serves as a venue for financial systems research and the development, testing and evaluation of software for financial networks, and the investigation of cybersecurity challenges in the financial domain.

With state-of-the-art technology, complete with the latest high-definition audio-visual instrumentation, the lab integrates the latest hardware and software technologies, accessing real-time data, as well as historical time series data, to support student-faculty innovative research in systemic risk, dynamic risk measures, portfolio optimization, high-frequency finance and financial networks.

Lab Financial Data Resources

- Bloomberg
- Thomson-Reuters Tick History
- Thomson-Reuters Machine-Readable News Feed
- Compustat (S&P)
- CRSP (University of Chicago)
- OneTick
- WRDS (Wharton)

Full lab data resources and software can be found at stevens.edu/hfslwiki

Innovative Lab Courses

- FE 511 Introduction to Bloomberg and Thomson Reuters
- FE 513 Financial Lab: Practical Aspects of Database Design
- FE 515 R in Finance
- FE 516 MATLAB for Finance
- FE 522 C++ Programming in Finance

The Lab offers 1-credit and 3-credit courses on trading platforms, as well as on programming languages, that count toward the financial engineering degree.

Full lab course listings can be found at stevens.edu/hfslwiki
GRADUATE CERTIFICATES

For practitioners interested in improving their skills and technical competencies, and for students considering new career paths, Stevens offers graduate certificates in the four financial engineering focus areas. All courses taken as part of a graduate certificate can be applied toward a master’s degree.

Quantitative Finance

FINANCIAL ENGINEERING

The components of financial problem-solving are embedded in the methods of applied mathematics, computational techniques, statistical analysis and economic theory. The Financial Engineering graduate certificate program is an online, instructor-led program that is directed towards solving problems in securities valuation, risk management, portfolio structuring and regulatory concerns with emphasis on tools and training in stochastic modeling, optimization, and simulation techniques.

- **FE 610** Stochastic Calculus for Financial Engineers
- **FE 620** Pricing and Hedging
- **FE 621** Computational Methods in Finance
- **FE 630** Portfolio Theory and Applications

MATHEMATICAL FINANCE

This four-course certificate strengthens the mathematical theory on which financial modeling and applications are built today. Students are taught sophisticated mathematical techniques that enable them to analyze problems arising from financial economics and equip them to tackle complex modeling in financial instrumentation and implementation. This certificate is ideal for mathematical majors and for those planning to be future quants.

- **MA 611** Probability Theory
- **FE 646** Optimization Models and Methods in Finance
- **FE 610** Stochastic Calculus for Financial Engineers
- **FE 710** Applied Stochastic Differential Equations

Financial Risk & Regulation

FINANCIAL RISK ENGINEERING

The recent turbulence in the financial market heightened the need for a much stronger understanding of the financial system, its environment and the risk measures applied in the industry to quantify risk in its multiple hierarchies. This certificate enables the graduate to fill this need and play an important role in balancing the interests of shareholders with the appropriate levels of risk taken by the managers and decision makers.

- **FE 535** Introduction to Risk Management
- **FE 610** Stochastic Calculus for Financial Engineers
- **FE 635** Financial Enterprise Risk Engineering
- **FE 655** Systemic Risk and Financial Regulation
Developed in collaboration with Accenture, the Financial Services Analytics (FSA) certificate is designed to meet the growing global need for professionals with expertise in data analytics. FSA is the science and technology of creating data-driven insights and analytical decision-making for the financial services industry. These insights increase the effectiveness of business operations, enhance customer relationships, improve product offerings and improve risk analysis and risk management. This certificate will prepare students with an array of statistical learning methods and database skills in order to create end-to-end business decision-making data analytical tools from an enterprise-level systems approach.

Qualified students will have the opportunity to participate in internships with Accenture. Scholarships funded by Accenture will be awarded to two students per year to cover tuition and fees for the certificate.

- **FE 582** Foundations of Financial Data Science with **FE 513** Practical Aspects of Database Design (lab)
- **FE 590** Introduction to Knowledge Engineering
- **FE 595** Financial Systems Technology (Analytical Financial Systems Design)
- **FE 550** Data Visualization Applications
- **FE 800** Special Projects in Financial Engineering

Recent years have seen unprecedented change in financial systems technology. Algorithmic trading has become a dominant component of trade volumes on exchanges. The implementation of software and automatic decision support systems in dynamic markets has become part of the skills needed to succeed in the domain of algorithmic finance. This four-course certificate is designed to provide financial engineers with the necessary understanding of architecting and implementing financial trading systems.

- **FE 545** Design, Patterns and Derivatives Pricing
- **FE 570** Market Microstructure and Trading Strategies
- **FE 620** Pricing and Hedging
- **FE 670** Algorithmic Trading Strategies

This graduate certificate is aimed at intra-system super structural software applications (ISSS). Retail software platforms, web trading desks, pricing software tools for new instruments including derivatives products and stochastic portfolio simulators, and cutting-edge information and knowledge discovery tools in a firm are all examples of software engineering or ISSS in financial institutions. This certificate explores these applications and how they work within a financial institution’s overall enterprise system.

- **SSW 540** Fundamentals of Software Engineering
- **SSW 565** Software Architecture and Component-based Design
- **FE 610** Stochastic Calculus for Financial Engineers
- **FE 620** Pricing and Hedging
RELEVANT CURRICULUM
Stevens graduate courses are designed with a theory and implementation perspective. Utilizing an Open Academic Model, the School of Systems and Enterprises (SSE) leverages global partnerships with industry and government to provide a highly relevant and engaged curriculum tailored to the real world and the skill competency needs of practitioners.

UNIQUELY QUALIFIED FACULTY
Stevens Institute of Technology brings together institute-wide faculty who are industry experts and practitioners, researchers and academics, with students who are committed to learning in a dynamic, diverse and engaged community. Stevens faculty possess a wealth of industry experience and expertise across diverse domains, including investment banking, risk management, data analytics, securities trading and portfolio management.

FLEXIBLE DELIVERY OPTIONS
Stevens Institute of Technology delivers its courses in convenient, flexible delivery formats including:
• Traditional semester courses held one evening a week for 15 weeks, on-campus at Stevens in Hoboken, NJ
• Online via our award-winning Stevens WebCampus
• On-site at industry locations worldwide

ADMISSION REQUIREMENTS
Applicants may apply online at stevens.edu/applications
• Completed application for admission
• $60 non-refundable fee
• An undergraduate degree in engineering or in computer science or in a related discipline, with a “B” average or better from an accredited college or university
• Completed prior coursework in Calculus and Differential Equations, Probability and Statistics, Linear Algebra and Programming Languages C++, Python or Java or R
• Official transcripts from all institutions attended
• Two letters of recommendation
• GRE / GMAT scores (Part-time students do not require GRE/GMAT scores)