There is high demand for experts who not only understand how financial markets work, but who possess in-depth knowledge of complex investment strategies, financial modeling skills, analytical competencies, computational expertise and practical know-how.

Our financial engineering division offers programs to prepare students with an 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.
MASTER OF SCIENCE DEGREES

Professionals with strong mathematical modeling and computational skills are needed to help solve the complex challenges of today’s increasingly technology-reliant financial industry. Stevens offers two master’s degrees – Master of Science in Financial Engineering and Master of Science in Financial Analytics – to equip graduates with technical and quantitative knowledge, and prepare them for careers in financial services and financial technology industries.

MASTER OF SCIENCE IN FINANCIAL ENGINEERING

Anchored on cutting-edge financial engineering research and best practices, this 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 (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.

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* or FE 900 Thesis in Financial Engineering  

From data processing to machine learning to statistical modeling and optimization, graduates are prepared to handle complex financial data, build advanced analytical models, deliver effective visualization product and utilize cloud-based data-driven analytics technology. The master’s degree requires 11 courses (33 credits); nine core required courses and two elective courses. At least three credits and up to six credits must be applied towards a project or thesis.

Required Core Courses

FE 530 or FE 535 Intro to Financial Modeling  
FE 582 Intro to Data Science + Lab / FE 513 Practical Aspects of Database Design  
FE 541 Statistics  
FE 550 or EM 622 Data Visualization  
FE 542 or MA 641 Time Series  
FE 590 or MIS 637 or BIA 656 or CS 513 / SDC 550 Machine Learning  
FE 595 or CS 549 Big Data  
FE 630 or FE 646 or MA 629 Optimization  
FE 800 Special Problems in Financial Engineering* or FE 900 Thesis in Financial Engineering  

*C a p s t o n e r e s e a r c h c o u r s e t h a t a l l o w s F E g r a d u a t e s t u d e n t s t o a p p l y t h e i r r e c e n t l y a c q u i r e d f i n a n c i a l e n g i n e e r i n g k n o w l e d g e t o r e a l w o r l d p r o b l e m s a t c o r p o r a t e i n t e r n s h i p s w i t h l e a d i n g f i n a n c i a l i n s t i t u t i o n s.
DOCTORAL DEGREE

The first financial engineering doctoral program developed in the U.S., the Doctor of Philosophy (Ph.D.) degree (a 54-credit, post master’s program) enables students to work with faculty on high-impact research and high-level design that will contribute to the advancement and growth of the financial engineering field in areas such as portfolio optimization, financial standards, systemic risk, behavioral finance and microstructure finance.

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.

Details on course listings for graduate certificates can be found at stevens.edu/school-systems-enterprises/graduate-certificates

FINANCIAL ENGINEERING

Financial problem-solving requires methods of applied mathematics, computational techniques, statistical analysis and economic theory. This program is directed towards solving problems in securities valuation, risk management, portfolio structuring and regulatory concerns with emphasis on 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

FINANCIAL STATISTICS

Analyzing and drawing meaningful conclusions from data is paramount to the financial industry. This program provides students with understanding of the financial industry, securities and derivatives, and prepares them to solve data problems through advanced techniques and proper statistical experiments.

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
Today, financial markets require deep understanding of the financial system, its environment and risk measures. This certificate prepares graduates to fill this need and help balance shareholders’ interests with the appropriate levels of risk taken by 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

Financial data analytics experts are in high-demand. Co-developed with Accenture, this certificate prepares students with statistical learning methods and database skills to create end-to-end business decision-making data analytical tools from an enterprise-level systems approach.

**FE 582** Foundations of Financial Data Science + lab / **FE 513** Practical Aspects of Database Design  
**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

*Maintained internship with Accenture and scholarships are available to qualified students.*

Professionals trained in complex financial computing are in high demand. Graduates acquire skills in the implementation of financial computing models and knowledge of financial databases, financial engineering software and specialized programming languages, which they get to use in a real-life financial computing project.

**FE 505** Technical Writing in Finance  
**FE 522** C++ Programming in Finance  
**FE 511** Introduction to Bloomberg and Thomson Reuters  
**FE 621** Computational Methods Finance  
**FE 699** Project in Financial Computing

*Plus choice of three electives*

The evolution of financial systems technology has made algorithmic trading a dominant component of trade volumes on exchanges. Graduates gain key understanding of architecting and implementing financial trading systems, software and automatic decision support systems in dynamic markets, making them competitive in the algorithmic finance domain.

**FE 545** Design, Patterns and Derivatives Pricing  
**FE 570** Market Microstructure and Trading Strategies  
**FE 620** Pricing and Hedging  
**FE 670** Algorithmic Trading Strategies
The first of its kind in the U.S., the Hanlon Lab, complete with state-of-the-art high-definition audio-visual instrumentation, integrates the latest hardware and software technologies to provide a contextual learning platform. Faculty and students can 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. Innovative 1-credit and 3-credit courses on trading platforms and programming languages that count toward a financial engineering degree are offered at the Lab.

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
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

NOTE: It is possible to complete this coursework at Stevens

- Official transcripts from all institutions attended
- Two letters of recommendation
- GRE / GMAT scores (Part-time students do not require GRE/GMAT scores)