The Financial Systems Center (FSC)

The Financial Systems Center (FSC) 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 FSC will serve as a platform for financial systems research, and the development, testing and evaluation of software for financial networks and the investigation of cyber-security challenges in the financial domain. The Center was formed to apply systems thinking and related methods to analysis, understand, and characterize the behavior of the complex global financial system.

The Hanlon Financial Systems Lab

The heart of the FSC is the state-of-the-art Hanlon Financial Systems Lab. This lab came into being as a result of a generous gift by Stevens Trustee and alumus, Sean Hanlon. The Lab will integrate the latest hardware and software technologies, accessing real-time data, as well as historical time series data, to support innovative research into the most common and urgent problems in contemporary finance. The Lab will also serve as a teaching and training venue for faculty, students and industry. The Hanlon Financial Systems Lab combines:

1. Advanced financial research and training facilities,
2. A software engineering lab for both development and evaluation,
5. A software engineering lab for both development and evaluation.
6. Advanced financial research and training facilities.

The Stevens Difference: Connecting the Classroom & the Financial World

The combination of all three functions in a single integrated financial systems laboratory will be the first of its kind. It will also support Stevens undergraduate degree programs in Quantitative Finance and Cybersecurity as well as graduate programs in Financial Engineering, Systems Security Engineering and Software Engineering.

RELEVANT CURRICULUM

Stevens Institute of Technology graduate courses are designed by researchers and practitioners for practitioners. Utilizing an Open Academic Model, the School of Systems and Enterprises (SSE), has partnered with the School of Engineering and Science, and the School of Management. This partnership allows Stevens Institute of Technology to leverage global partnerships with industry and government to provide highly relevant and engaged curriculum tailored to the real-world education and skill competency needs of practitioners.

UNIQUELY QUALIFIED FACULTY

Stevens Institute of Technology brings together institution-wide faculty who are industry experts and practitioners, researchers, and educators, with students who are committed to learning in a dynamic, diverse, and engaged community. Hanlon faculty possess a wealth of industry and government experience, and expertise across diverse domains, including Aerospace, Information Technology, Security, Telecommunications, Finance, and Defense.

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,
- A 5-day, 10-day or 20-day intensive (Delivered over five consecutive days, or in modified formats, i.e., 2 consecutive days + 2 consecutive days + 1 day, for a total of five full days),
- Online via Stevens WebCampus,
- On-site at industry and government sponsor locations worldwide.

STEVENS ADMISSION REQUIREMENTS

- Completed application for admission
- An undergraduate degree in engineering or in finance, computer science or in a related discipline, with a “B” average or better from an accredited college or university
- Official college transcripts
- GRE or GMAT
- Three letters of recommendation
- 4.5 or GPA

Application materials should be sent or faxed to the attention of the Office of Graduate Admissions, Castle Point on Hudson, Hoboken, NJ. Fax number 201.216.8044.

Financial Engineering Admission Criteria

Students wishing to apply for admission in any of the FE programs/concentrations must have an undergraduate degree in an engineering or science discipline and have completed prior coursework in:
- Calculus and Differential Equations,
- Linear Algebra,
- Probability and Statistics,
- Programming Languages C++ or Java and Spreadsheet.

CONTACT

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stevens.edu/FE

GRADUATE CERTIFICATES • MASTER’S DEGREE • DOCTORAL DEGREE

The vast complexity of financial markets compels industry to look for experts who not only understand how they work, but also possess the mathematical knowledge to answer their patterns and the computer skills to exploit them. The Financial Engineering program at the School of Systems & Enterprises at Stevens challenges students to think in innovative ways to integrate quantitative methods with the theoretical framework and institutional settings in which they are applied. The program’s combination of technical elements and applied mathematics develops the analytical skills, technical competencies and managerial skills students need to immediately impact the decision making process at financial enterprises in areas such as risk management, securities valuation, computational techniques and trading and portfolio management.

Taught by a renowned faculty comprised of prominent scholars and industry luminaries, courses are anchored in cutting-edge research and best practices in financial engineering. With sharply honed practical skills complemented by strong technical elements, this intensive and highly focused program prepares graduates for careers in the industries of investment banking, risk management, securities trading and portfolio management.
The Financial Software Engineering Graduate Certificate is aimed at intra-system super structural software applications in financial institutions. The Financial Risk Engineering graduate certificate is designed to fill this need. This program will equip students and professionals with a solid understanding of the issues surrounding financial risk in both theoretical and practical aspects. Required courses for this certificate include:

- FE 610 Stochastic Calculus for Financial Engineers
- FE 620 Pricing and Hedging
- FE 650 Computational Methods in Finance
- FE 680 Portfolio Theory and Applications

**GRADUATE CERTIFICATES**

Four-course, 12 credits. All courses taken as part of a Graduate Certificate can be applied toward a Master's Degree.

**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, instruction-based program that is directed toward solving problems in securities valuation, risk management, portfolio structuring and regulations. Students work with emphasis on stochastic modeling, optimization, and simulation techniques. Required courses for this Certificate include:

- FE 630 Stochastic Calculus for Financial Engineers
- FE 650 Computational Methods in Finance
- FE 680 Portfolio Theory and Applications

**finance Mathematics**

Required courses for this Certificate include:

- MAA 613 Probability Theory
- MAA 623 Stochastic Processes
- FE 710 Applied Stochastic Differential Equations

**FINANCIAL RISK ENGINEERING**

The certificate in the financial system is designed to meet the increasing demand for efficiency, effective-ness and integration in engineering and business operations across various industries. Required courses for this Certificate include:

- FE 630 Stochastic Calculus for Financial Engineers
- FE 650 Enterprise Risk Engineering
- FE 680 Systems Risk and Financial Regulation

**Financial Information Systems**

(Choose one of the two certificates listed below for this focus area)

**DATABASE SYSTEMS**

Required courses for this Certificate include:

- CS 555 Database Management Systems
- CS 552 Database Management Systems II
- CS 543 NoSQL Programming
- CS 574 Object-Oriented Analysis and Design

**BUSINESS INTELLIGENCE AND ANALYTICS**

Required courses for this Certificate include:

- BDS 560 Data Warehousing & Business Intelligence
- BDS 617 Knowledge Discovery in Databases
- BIA 652 Multivariate Data Analytics
- BIA 658 Social Network Analytics

**ALGORITHMIC TRADING**

Required courses for this Certificate include:

- FE 541 Design, Patterns and Derivatives Pricing
- FE 570 Market Microstructure and Trading Strategies
- FE 150 Algorithmic Trading

**Financial Software Engineering**

The Financial Software Engineering Graduate Certificate is aimed at intra-system super structural software applications. Required courses for this Certificate include:

- SSD 540 Fundamentals of Software Engineering
- SSD 655 Software Architecture and Component-Based Design
- FE 630 Stochastic Calculus for Financial Engineers
- FE 650 Enterprise Risk Engineering

**NETWORKS AND SYSTEMS ADMINISTRATION**

Required courses for this Certificate include:

- CS 520 Operating Systems
- CS 615 Systems Administration
- CS 521 TCP/IP Networking
- CS 601 Network Management

**MBA WITH A FINANCIAL ENGINEERING CONCENTRATION**

The MBA with a Financial Engineering Concentration is designed to provide a comprehensive education in financial engineering. Students are encouraged to specialize in one of four FE focus areas (graduate certificate tracks and courses are listed in the graduate certificate section), however, students can choose to complete electives in other area programs with Faculty Advisor approval.

- Quantitative Focus
- Financial Software Engineering & Management
- Financial Information Systems & Management
- Financial Engineering & Management

**DOCTORAL DEGREE**

Doctoral Degree in Financial Engineering

(60 credits, post Master’s and minimum 30 research credits)

The program leading to the Doctor of Philosophy (Ph.D.) degree is designed to develop your ability to perform research or high-level design in Financial Engineering. Admission to the doctoral program is made through the School's Committee on Doctoral Admissions (CDA) and is based on a review of your academic record, professional accomplishments and fit between your research objectives and those of the available SSE faculty. A majority of a student’s coursework must include FE courses and coursework can be included in combination with a graduate Faculty Advisor.