FINANCIAL ENGINEERING: AUTOMATED TRADING PRACTICES, MS

for the degree of Master of Science in Financial Engineering, Automated Trading Practices concentration

Financial Engineering (FE) is the application of quantitative methods to the analysis of financial markets and financial products. The quantitative techniques may include Mathematics, Statistics, Computer Science, Machine Learning, Neural Nets, and generalized Data Analytics. The applications include searching for opportunities as well as deriving solutions to financial problems. All financial markets are a subject for FE, from public exchanges to private over-the-counter markets. Similarly, all financial products, from equities, bonds and derivatives to bitcoins are candidates for quantification. An overarching theme for FE involves balancing reward against techniques for the measurement, management, and mitigation of risk.

Graduate Degree Programs in Financial Engineering
The Master of Science in Financial Engineering (MSFE) degree program is jointly sponsored by the Department of Industrial and Enterprise Systems Engineering (ISE) (https://ise.illinois.edu) in The Grainger College of Engineering and the Department of Finance (https://giesbusiness.illinois.edu/finance/) in the Gies College of Business. Graduates from this program receive the MSFE degree awarded by the Graduate College. The MSFE program complements other graduate programs offered by the sponsoring departments. The Master of Science in Financial Engineering (terminal master's) can be completed in 18 months with an option to extend to 24 months, beginning in August each year. The second and subsequent semesters allow students the flexibility to pursue specialized tracks within the program, such as data analytics and electronic trading. A corporate-sponsored "practicum", provides students opportunities to address real world financial modeling problems and provides access to state-of-the-art analytic tools and software products.

Concentrations

- Advanced Analytics in Industrial & Enterprise Systems Engineering (http://catalog.illinois.edu/graduate/engineering/concentration/advanced-analytics-industrial-enterprise-systems-engineering/)
- Automated Trading Practices (p. 1)
- Data Analytics in Finance (http://catalog.illinois.edu/graduate/bus/concentration/finance/data-analytics-finance/)

Admission
Applicants to the MSFE Program will have a Bachelor's degree with one year of calculus, one semester of linear algebra, one semester of programming (preferably in C/C++), and one semester of probability and statistics. Knowledge of basic finance and economics is helpful but not necessary. Given its technical emphasis, applicants to this program typically will have completed a Bachelor's degree in an engineering field, mathematics, physics, computer science, or economics that provides sufficient preparation to facilitate a fast-paced, in-depth learning environment.

All applicants are expected to have a minimum grade point average of at least 3.25 (A=4.00) for the last two years of undergraduate study and a 3.50 for any previous graduate work completed.

All applicants whose native language is not English are required to submit TOEFL (http://www.toefl.org/) or International English Language Testing System (IELTS) (http://www.ielts.org/) scores as evidence of English proficiency. Minimum admission requirements (https://grad.illinois.edu/admissions/instructions/04c/) are set by the Graduate College. Under certain circumstances applicants may be exempt (https://grad.illinois.edu/admissions/instructions/04c/) from the TOEFL/IELTS requirement.

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Code	Title	Hours
Required:		**4**
IE 421	High Frequency Trading Technology	
Pick 1 Algo Trading Course:		**4**
FIN 554	Algorithmic Trading Systems Design and Testing	
FIN 556	Algorithmic Market Microstructure	
Pick 1 Stochastic & Learning Foundations Course Complete 4 hours from the Stochastic & Learning Foundations Course List or choose an additional 4 hours from the Algo Trading Course List.		**4**
IE 410	Advanced Topics in Stochastic Processes & Applications	
IE 434	Deep Learning: Mathematics and Applications	
IE 518	Queueing Systems	
IE 531	Algorithms for Data Analytics	
IE 534	Deep Learning	
Total Hours These 12 hours may be used toward the major degree requirements.		**12**

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Department Head (Industrial & Enterprise Systems Engineering): Jeff Shamma
Department Head (Finance): Louis Chan
Program Director: Liming Feng
Financial Engineering program website
Financial Engineering faculty
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(217) 300-7346
Financial Engineering program email

Admissions
Application Inquiries email (msfe-apply@illinois.edu)
Financial Engineering Program Overview of Admissions & Requirements (https://msfe.illinois.edu/admissions/requirements.aspx)
Graduate College Admissions & Requirements (https://grad.illinois.edu/admissions/apply/)

Grainger College of Engineering
Grainger College of Engineering website (https://grainger.illinois.edu/)