

Kellogg School of Management



Kellogg
School of Management

UNDERGRADUATES

Certificate Program for



YOUR CAREER **STARTS** HERE

The job market is more competitive than ever, but sharp analytical skills are always in demand.

In the Kellogg Certificate Program for Undergraduates, you'll master graduate-level material in business analytics and finance under the guidance of distinguished Kellogg professors. But the program isn't just for students interested in finance or consulting — the critical thinking skills you'll gain here are valuable in any line of work.

Whether you study English or engineering, economics or art history, these specialized skills will help you launch a successful career. As you learn to approach the broad subject of your major with the precision of financial analysis, you'll be uniquely qualified to break down the trends in science, technology, economics and politics on which many major business decisions hinge.

The program is open* to all Northwestern University juniors and seniors, regardless of home school or major, who have completed advanced coursework in calculus, linear algebra, probability, econometrics, statistics, and microeconomics.

THE RIGHT TRACK

Certificate Program students earn a certificate in either Financial Economics or Managerial Analytics. FE students — who generally are interested in pursuing a career in finance — learn valuation tools and financial applications, while the MA students develop analytic tools and skills used in business planning, operations and consulting. Each track consists of four courses.

Students in both tracks hone their critical-thinking and communication skills and learn to navigate the difficult terrain of the business world. Graduates may work in banking, investment banking, insurance, asset management or consulting. They may work in any sector: private, public, for-profit or non-profit.

**Application required.*



Certificate in **FINANCIAL ECONOMICS**



All FE certificate students take the following four courses.

Principles of Finance

This foundation course for the FE certificate is taken in the fall. The course discusses the principles of finance and focuses on the effects of time and uncertainty on value. Students will learn valuation, including discounted cash flows; equity and debt valuation; the term structure of interest rates; portfolio theory; asset pricing; and efficient market theory. The course also examines firms' financing decisions, including capital budgeting, capital structure and payout policy.

Investments

Students will learn about active portfolio strategies in bonds and stocks, optimal portfolio selection from the perspective of individual and institutional investors, and the role of style and performance benchmarks in portfolio management. Special topics such as performance evaluation and trading costs are also covered.

Derivatives

This course covers the fundamentals of forwards, futures, options and related derivative securities. Associated arbitrage pricing models and the use of derivatives in risk management are discussed in depth. Topics include cash-and-carry strategies in forward markets, the notions of cost-of-carry and convenience yield, the optimal exercise of American options, the binomial model, and the option pricing theory of Black, Merton and Scholes.

Topics in Financial Economics

This course focuses on current issues in finance, and specific content varies from year to year. The class has focused recently on value investing, empirical support for the value approach to investing, disruptions in credit markets and the recent financial crisis. Other topics, including fixed income, will be the focus of future courses.

Students earning the Financial Economics certificate will be prepared for responsibilities that include:

- ▶ Cash-flow analysis and financial modeling
 - ▶ Obtaining, financing and comparing capital structure choices
 - ▶ Analysis of potential mergers and acquisitions
 - ▶ Capital budgeting and capital allocation decisions
 - ▶ Portfolio investment and asset management
 - ▶ Risk management strategies
 - ▶ Research cash flow and valuation estimates
 - ▶ Support client interactions with analysis and presentations
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A woman with curly brown hair, wearing a black blazer over a red shirt, is speaking and gesturing with her right hand. In the foreground, a student in a black polo shirt is writing in a notebook. The background is a plain, light-colored wall.

Certificate in **MANAGERIAL ANALYTICS**

All MA certificate students take the following four courses.

Analytical Decision Modeling

Taken in the fall quarter, this foundation course involves structuring, analyzing and solving business decision problems using Excel spreadsheets. Problems of optimal resource allocation and risk analysis of decisions involving uncertainty are considered. Some data analysis and demand forecasting is also covered. Topics include: optimization by Solver, risk analysis by Monte Carlo simulation, analysis of sequential decisions by decision trees, data analysis by pivot tables and filters, and demand forecasting by time series analysis. The focus of the course will be on systematic, logical thinking and problem solving through applications and economic interpretations rather than development of the underlying theory or algorithms.

Pricing

Students will compare the three main ways to set prices: haggling/negotiation, posted price and auctions, and learn how to choose the best method in a given situation. They will also explore customizing the price of the same product or service to different segments, using optimization models to set prices when volume is uncertain, and pricing multiple products. This course also offers an introduction to some of the main techniques (regression, conjoint analysis, EVC) for gathering information about buyer valuations and demands.

Operations and Supply Chain Strategy

This course provides a framework to discover the key capabilities an operation and a supply chain must develop to support the business strategy of a firm, and the relationship between the desired capabilities and the structure of a supply chain. Students will learn about methodologies that support operations and supply chain strategy and planning decisions, using case studies and development of analytical spreadsheet models.

Principles of Finance

This course discusses the principles of finance and focuses on the effects of time and uncertainty on value. Students will learn valuation, including discounted cash flows; equity and debt valuation; the term structure of interest rates; portfolio theory; asset pricing; and efficient market theory. The course also examines firms' financing decisions, including capital budgeting, capital structure and payout policy.

Students earning the Managerial Analytics certificate will be prepared for responsibilities that include:

- ▶ Analyzing business decisions on spreadsheets
 - ▶ Analysis of potential mergers and acquisitions
 - ▶ Investment decisions in a supply chain network
 - ▶ Analyzing and optimizing supply chain networks
 - ▶ Analysis to support pricing decisions
 - ▶ Statistical analysis of current trends in business practices, products and industry competition
 - ▶ Using spreadsheets and statistical software to analyze sales and operations and develop forecasts
 - ▶ Supporting client interactions with analysis and presentations
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THE **KELLOGG** ADVANTAGE

The Kellogg School of Management has partner institutions and active alumni associations all over the world. Its students are known for their ability to work well in — and lead — diverse teams of talented people. The inclusive, collaborative culture has fostered generations of dynamic leaders.

The school's programs are consistently top-ranked in publications such as *BusinessWeek* and *U.S. News and World Report*. Our professors are renowned researchers and many have literally written the books on the subjects they teach.

CAREER SERVICES AND MORE

A partnership between the Kellogg School and Northwestern University Career Services allows students to work with a dedicated adviser who combines Career Services' knowledge of undergraduate job opportunities with the Kellogg School's expertise in financial and consulting organizations. The Certificate Program's career services adviser helps students connect with the leading employers of undergraduates for summer internships and full-time jobs upon graduation.

Kellogg also provides study rooms and a student lounge used exclusively by Certificate Program students.

Summer internships

Students who start the program during their junior year may build on their knowledge by completing an internship at a company during the summer before their senior year or by conducting a research project with a Kellogg faculty member. The student arranges the internship with the help of the CPU career services adviser.

APPLY

To apply, a student should demonstrate excellent quantitative and communication skills and have taken prerequisite courses in advanced calculus and linear algebra, probability, econometrics and statistics, and microeconomics. Any Northwestern University student who meets these criteria may apply, regardless of school or major. The program is for Northwestern students only.

The program accepts about 100 students each year — 50 in each certificate track. Students apply at the end of their sophomore or junior years for participation during the following school year. Applications are due at the end of the winter quarter and admission decisions are made during the spring quarter.

The FE and MA certificates are not graduate degrees. Certificate Program students receive their undergraduate diplomas from their home schools — not the Kellogg School — but their transcripts will reflect a completed certificate from Kellogg.

For more information, please visit kellogg.northwestern.edu/certificate.

Certificate Program for Undergraduates

Kellogg School of Management
2001 Sheridan Road, Room 252
Evanston, IL 60208-2001
p: 847.467.4600 f: 847.467.0603
kelloggundergrad@northwestern.edu

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05-09/12M/KM



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