

ADVANCED ANALYTICS IN INDUSTRIAL & ENTERPRISE SYSTEMS ENGINEERING CONCENTRATION

for the concentration of Advanced Analytics in Industrial & Enterprise Systems Engineering (on campus & online)

The Advanced Analytics in Industrial & Enterprise Systems Engineering Concentration prepares students to relate the application of engineering approaches and methods to the analysis and management of engineering and business processes which are data-oriented. Students will be able to provide companies and organizations with the ability to convert the massive amounts of data received into useful information that can help shape the decisions companies and organizations make.

Students must be enrolled in the Industrial Engineering MS (<http://catalog.illinois.edu/graduate/engineering/industrial-engineering-ms/>) (thesis or non-thesis) or Financial Engineering MS (http://catalog.illinois.edu/graduate/bus_engineering/financial-engineering-ms/) degree programs. After the first enrolled semester the student notifies the ISE Graduate Programs Office of their intention to enroll in the concentration and file a petition to add the Advanced Analytics Concentration with the Graduate College.

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The Advanced Analytics in Industrial & Enterprise Engineering Concentration is available and all 12 hours count towards completion of:

Industrial Engineering MS (<http://catalog.illinois.edu/graduate/engineering/industrial-engineering-ms/>)
Financial Engineering, MS (http://catalog.illinois.edu/graduate/bus_engineering/financial-engineering-ms/)

Code	Title	Hours
Advanced Analytics Core:		8
IE 434	Deep Learning: Mathematics and Applications (Deep Learning: Mathematics and Applications)	
IE 522	Statistical Methods in Finance	
IE 525	Stochastic Calculus & Numerical Models in Finance	
IE 529	Stats of Big Data & Clustering	
IE 531	Algorithms for Data Analytics	
IE 532	Analysis of Network Data	
IE 533	Big Graphs and Social Networks	
IE 534	Deep Learning	
Take an additional core course from above, or select one from list below		4
Advanced Analytics Secondary:		
IE 400	Design & Anlys of Experiments	

IE 410	Advanced Topics in Stochastic Processes & Applications	
IE 411	Optimization of Large Systems	
IE 510	Applied Nonlinear Programming	
IE 511	Integer Programming	
IE 514	Optimization Methods for Large-Scale, Network-Based Systems	
IE 521	Convex Optimization	
IE 523	Financial Computing	
SE 524	Data-Based Systems Modeling	
Total Hours		12

Other Requirements

Requirement	Description
Students to earn a B or better in each concentration course.	

Graduate Programs in Industrial & Enterprise Systems Engineering

Industrial Engineering, M (<http://catalog.illinois.edu/graduate/engineering/industrial-engineering-ms/>)S

optional concentrations:

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Computational Science & Engineering (<http://catalog.illinois.edu/graduate/engineering/concentration/computational-science-engineering/>)

Industrial Engineering, PhD (<http://catalog.illinois.edu/graduate/engineering/industrial-engineering-phd/>)

optional concentrations:

Computational Science & Engineering (<http://catalog.illinois.edu/graduate/engineering/concentration/computational-science-engineering/>)

Systems & Entrepreneurial Engineering, MS (<http://catalog.illinois.edu/graduate/engineering/systems-entrepreneurial-engineering-ms/>)

optional concentrations:

Computational Science & Engineering (<http://catalog.illinois.edu/graduate/engineering/concentration/computational-science-engineering/>)

Systems & Entrepreneurial Engineering, PhD (<http://catalog.illinois.edu/graduate/engineering/systems-entrepreneurial-engineering-phd/>)

Financial Engineering, MS (http://catalog.illinois.edu/graduate/bus_engineering/financial-engineering-ms/) (sponsored jointly with Department of Finance)

optional concentrations:

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Automated Trading Practices (<http://catalog.illinois.edu/graduate/engineering/financial-engineering-ms/automated-trading-practices/>)

Data Analytics in Finance (<http://catalog.illinois.edu/graduate/bus/concentration/finance/data-analytics-finance/>)

Health Technology, MS (<http://catalog.illinois.edu/graduate/ahs/health-technology-ms/>) (sponsored jointly with the College of Applied Health Sciences)

The Department of Industrial and Enterprise Systems Engineering (ISE) offers graduate programs leading to degrees of Master of Science and Doctor of Philosophy in Industrial Engineering (IE) and Systems and Entrepreneurial Engineering (SEE), as well as (jointly with the Department of Finance) Master of Science in Financial Engineering. The ISE programs offers an approach to industrial engineering and systems engineering, engineering design, and entrepreneurial engineering that crosses disciplinary lines. The IE program is based in advanced studies that focus on operations research, optimization, supply chain management, financial engineering, quality and reliability engineering and production management, with the aim to advance modeling, simulation, analysis and decision making for complex engineering and economic systems. The SEE program is founded on the premise of dual competency in both traditional engineering and systems integration. The SEE program offers flexibility by permitting the student to select from a menu of advanced courses and take a wide range of electives to meet individual career goals. Graduates of these programs are prepared to enter academic and professional engineering positions in universities, industry, government, and private practice.

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overview of admissions & requirements: <https://ise.illinois.edu/graduate/admissions/>

overview of grad college admissions & requirements: <https://grad.illinois.edu/admissions/apply> (<https://grad.illinois.edu/admissions/apply/>)

department website: <https://ise.illinois.edu/>

program website: <https://ise.illinois.edu/graduate/degrees-and-programs/advanced-analytics-concentration.html>

department faculty: <https://ise.illinois.edu/directory/faculty.html>

college website: <https://grainger.illinois.edu/>

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