

# 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/](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/](http://catalog.illinois.edu/graduate/bus_engineering/financial-engineering-ms/))

Code	Title	Hours
<b>Advanced Analytics Core:</b>		<b>8</b>
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	
<b>Take an additional core course from above, or select one from list below</b>		<b>4</b>
<b>Advanced Analytics Secondary:</b>		
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
<b>Total Hours</b>	<b>12</b>

## Other Requirements

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

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## Department of Industrial & Enterprise Systems Engineering

**Department Head:** Jeff Shamma ([jshamma@illinois.edu](mailto:jshamma@illinois.edu))

**Associate Head of Graduate Studies:** Ramavarapu S Sreenivas ([rsree@illinois.edu](mailto:rsree@illinois.edu))

Department of Industrial & Enterprise Systems Engineering website (<https://ise.illinois.edu/>)

Department of Industrial & Enterprise Systems Engineering faculty (<https://ise.illinois.edu/directory/faculty.html>)

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

117 Transportation Building, 104 S Mathews Ave, Urbana, IL 61801 (217) 333-2730

Department of Industrial & Enterprise Systems Engineering email ([ise-grad@illinois.edu](mailto:ise-grad@illinois.edu))

## Grainger College of Engineering

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

## Admissions

Department of Industrial & Enterprise Systems Engineering Overview of Admissions & Requirements (<https://ise.illinois.edu/graduate/admissions/>)

Graduate College Admissions & Requirements (<https://grad.illinois.edu/admissions/apply/>)