INDUSTRIAL ENGINEERING:
ADVANCED ANALYTICS IN
INDUSTRIAL & ENTERPRISE
SYSTEMS ENGINEERING, MS

for the Master of Science in Industrial Engineering, Advanced Analytics in
Industrial & Enterprise Systems Engineering Concentration (on campus &
online)

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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
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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IL 61801
phone: (217) 333-2731
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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) degree program. 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.

Other Graduate Programs in Industrial & Enterprise
Systems Engineering
degrees:

Industrial Engineering, MS (http://catalog.illinois.edu/
graduate/engineering/industrial-engineering-ms)
optional concentrations:
Advanced Analytics in Industrial & Enterprise Systems
Engineering (p. 1))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/
business-engineering/financial-engineering-ms) (sponsored jointly
with Department of Finance)
optional concentrations:
Computational Science & Engineering (http://
catalog.illinois.edu/graduate/engineering/concentration/
computational-science-engineering)

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
offer an approach to industrial engineering and systems engineering,
generic 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.

Opportunity also exists for specializing in energy and sustainability
engineering via the

Energy and Sustainability Engineering (EaSE) Graduate
Certificate Option (http://ease.illinois.edu)

for the Master of Science in Industrial Engineering, Advanced Analytics in
Industrial & Enterprise Systems Engineering Concentration (on campus &
online)

Students must be enrolled in and complete the Industrial Engineering MS
(http://catalog.illinois.edu/graduate/engineering/industrial-engineering-
ms) (thesis or non-thesis) degree program to earn the concentration.

Information listed in this catalog is current as of 04/2020
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Advanced Analytics Core:</strong></td>
<td>8</td>
</tr>
<tr>
<td>IE 528</td>
<td>Computing for Data Analytics</td>
<td></td>
</tr>
<tr>
<td>IE 529</td>
<td>Stats of Big Data &amp; Clustering</td>
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<tr>
<td>IE 530</td>
<td>Optimization for Data Analytics</td>
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<tr>
<td>IE 531</td>
<td>Algorithms for Data Analytics</td>
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</tr>
<tr>
<td>IE 532</td>
<td>Analysis of Network Data</td>
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<tr>
<td>IE 533</td>
<td>Big Graphs and Social Networks</td>
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<td></td>
<td><strong>Advanced Analytics Secondary:</strong></td>
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<tr>
<td>IE 400</td>
<td>Design &amp; Analysis of Experiments</td>
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<tr>
<td>IE 410</td>
<td>Advanced Topics in Stochastic Processes &amp; Applications</td>
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<tr>
<td>IE 411</td>
<td>Optimization of Large Systems</td>
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<tr>
<td>IE 510</td>
<td>Applied Nonlinear Programming</td>
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<tr>
<td>IE 511</td>
<td>Integer Programming</td>
<td></td>
</tr>
<tr>
<td>IE 521</td>
<td>Convex Optimization</td>
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</tr>
</tbody>
</table>

**Total Hours**: 12

1. Complete 4 hours from the Advanced Analytics Secondary Course List or choose an additional 4 hours from the Advanced Analytics Core Course List.
2. Students to earn a B or better in each concentration course.
3. These 12 hours may be used toward the major degree requirements.