INDUSTRIAL ENGINEERING, PHD

for the degree of Doctor of Philosophy in Industrial Engineering

department head: Deborah L Thurston (thurston@illinois.edu)
associate head of graduate studies: Ramavarapu S Sreenivas (rsree@illinois.edu)
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/phd-degree-guide.html
department faculty: https://ise.illinois.edu/directory/faculty.html
college website: https://grainger.illinois.edu/
contact: Lauren Redman (lredman@illinois.edu)
address: 117 Transportation Building, 104 S Mathews Ave, Urbana, IL 61801
phone: (217) 333-2731
email: ise-grad@illinois.edu

The Department of Industrial & Enterprise Systems Engineering offers both a traditional doctoral program and a direct doctoral program. A Master’s degree is not required for admission to the direct doctoral program. Students in both programs are required to have a research advisor and are encouraged to contact department faculty (https://ise.illinois.edu/directory/faculty.html) in their areas of interest to inquire about possible research and funding opportunities.

Admission Requirements
Applicants who have completed degree requirements in an accredited engineering program or its equivalent are eligible to apply for admission. A minimum grade point average of 3.25 (A = 4.00) for the last two years of undergraduate study is required.

Scores on the Graduate Record Examination (GRE) (http://www.ets.org/) general test are required of all applicants. Based upon the previous preparation of the student for either program, prerequisite courses may be specified by the advisor, but the credit may not be applied toward a degree.

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.

Financial Aid
Qualified students may compete for financial assistance in the form of teaching/graduate/research assistantships, fellowships, grants, and tuition waiver scholarships. Under certain conditions, fellowships may be augmented by part-time assistantships. Starting in Fall 2020, Grainger Engineering PhD students in their first five years of enrollment who meet the minimum eligibility requirements (https://grainger.illinois.edu/academics/graduate/phd-funding-guarantee/) are guaranteed a funded appointment for fall and spring that includes a full tuition waiver, a partial fee waiver, and a stipend.

All applicants, regardless of US citizenship, whose native language is not English and who wish to be considered for teaching assistantships must demonstrate spoken English language proficiency (http://grad.illinois.edu/admissions/taengprof.htm) by achieving a minimum score of 24 on the speaking subsection of the TOEFL iBT or 8 on the speaking subsection of the IELTS. For students who are unable to take the iBT or IELTS, a minimum score of 4CP is required on the English Proficiency Interview (http://cte.illinois.edu/testing/oral_eng/epi_overview.html) (EPI), offered on campus. All new teaching assistants are required to participate in the Graduate Academy for College Teaching (https://citl.illinois.edu/citl-101/teaching-learning/grad-academy-for-college-teaching/) conducted prior to the start of the semester.

Department Research
Faculty research by ISE faculty is pursued in the following fields:

- computer-aided design
- computer-aided analytics
- computer-aided optimization
- computer-aided design systems
- computer-aided manufacturing systems
- nondestructive system testing
- nondestructive system control
- nondestructive system robotics
- nondestructive system real-time decision making
- reliability engineering
- reliability engineering systems
- reliability engineering science
- human factors
- supply chain logistics

Members of the ISE Department have access to a wide range of excellent research facilities. These laboratories support a wide range of activity and are described at the department’s research laboratories Web site (https://ise.illinois.edu/research/labs/).

Graduate Programs in Industrial & Enterprise Systems Engineering

degrees:

Information listed in this catalog is current as of 02/2021
Industrial Engineering, MS (http://catalog.illinois.edu/graduate/engineering/industrial-engineering-ms/)

**optional concentrations:**  
Advanced Analytics in Industrial & Enterprise Systems Engineering (http://catalog.illinois.edu/graduate/engineering/concentration/advanced-analytics-industrial-enterprise-systems-engineering/)  
Computational Science & Engineering (http://catalog.illinois.edu/graduate/engineering/concentration/computational-science-engineering/)  

Industrial Engineering, PhD (p. 1)

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

**optional concentrations:**  
Advanced Analytics in Industrial & Enterprise Systems Engineering (http://catalog.illinois.edu/graduate/engineering/concentration/advanced-analytics-industrial-enterprise-systems-engineering/)  
Data Analytics in Finance (http://catalog.illinois.edu/graduate/bus/concentration/finance/data-analytics-finance/)

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, 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.

Opportunity also exists for specializing in energy and sustainability engineering via the Energy and Sustainability Engineering (EaSE) Graduate Certificate Option (http://ease.illinois.edu/)

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Qualifying exam: Qualifying examinations should be taken as early as possible

Preliminary exam

Final exam or dissertation defense

Dissertation deposit

Minimum GPA: 3.0

**Entering with approved B.S./B.A. degree**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>IE 599</td>
<td>Thesis Research (min-max applied toward the degree)</td>
<td>40</td>
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<tr>
<td>IE 590</td>
<td>Seminar (registration for 0 hours every term while in residence)</td>
<td>0</td>
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<td></td>
<td>Elective courses – chosen in consultation with advisor</td>
<td>56</td>
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| Total Hours | 96 |

**Other Requirements and Conditions**

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<thead>
<tr>
<th>Requirement</th>
<th>Description</th>
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<tr>
<td>Other Requirements and Conditions may overlap</td>
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<tr>
<td>Minimum 500-level Hours Required Overall:</td>
<td>24</td>
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<td></td>
<td>For the thesis option, a maximum of 4 hours of IE 597 (or other approved</td>
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<td>independent study) may be applied toward the elective course work requirement.</td>
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<td>4 hours of the elective courses must be from a College of Engineering</td>
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<td>department, including ABE and CHBE.</td>
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<td></td>
<td>A maximum of 4 CR-graded credit hours in non-IE courses may be applied</td>
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<td>toward the degree.</td>
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<td>Ph.D. exam and dissertation requirements:</td>
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<tr>
<td>Qualifying exam: Qualifying examinations should</td>
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<td>be taken no later than the fifth semester for</td>
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<td>those entering with approved B.S. or B.A. degree.</td>
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<td>Preliminary exam</td>
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