INDUSTRIAL ENGINEERING, PH.D.

The Department of Industrial and Systems Engineering offers opportunities for graduate study leading to the master of science and the doctor of philosophy degrees in industrial and systems engineering.

In the Ph.D. program, four areas of specialization are available, each designed to produce graduates capable of leading new and developing areas within industrial and systems engineering. The four areas are: decision science/operations research, health systems, human factors and ergonomics, and manufacturing and production systems.

The specialization in operations research, optimization, and analytics trains students in analytical methodologies useful for solving decision problems, especially problems that involve the allocation of scarce resources, and the design, planning and operation of complex systems. Graduate study focuses on optimization modeling and algorithms, applied probability and stochastic modeling, and decision analysis.

The health systems specialization seeks to train students to look at broad issues in health care, including long-term care, prevention, quality improvement, health care financing, and system evaluation. Understanding how people solve problems is a basic requirement for health systems engineers, who must apply scientific methods in a value-laden setting.

The specialization in human factors and ergonomics is concerned with the quality of work lives, ergonomics, and occupational safety and health for both workers and management. By examining, designing, testing, and evaluating the workplace and how people interact within it, human systems engineers can create productive, safe, and satisfying work environments.

The specialization in advanced manufacturing and industrial AI is intended to provide the skills and knowledge necessary to compete successfully in a manufacturing environment. These skills include knowledge of the theory of manufacturing materials and processes and their control; knowledge of the essentials of manufacturing systems design and analysis; and knowledge of and hands-on experience with modern manufacturing technology.

ADMISSIONS

Please consult the table below for key information about this degree program’s admissions requirements. The program may have more detailed admissions requirements, which can be found below the table or on the program’s website.

Graduate admissions is a two-step process between academic programs and the Graduate School. Applicants must meet the minimum requirements (https://grad.wisc.edu/apply/requirements/) of the Graduate School as well as the program(s). Once you have researched the graduate program(s) you are interested in, apply online (https://grad.wisc.edu/apply/).

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall Deadline</td>
<td>December 15</td>
</tr>
<tr>
<td>Spring Deadline</td>
<td>October 1</td>
</tr>
</tbody>
</table>

APPLICATION DEADLINES:

- **Fall**: Dec. 15th
- **Spring**: Oct. 1st
- **Summer**: Dec. 15th

Reentry applicants: July 15 (fall), December 1 (spring), and must notify an academic advisor.

Additional reentry information (https://grad.wisc.edu/admissions/previousenrolled/)

Note: Although we accept summer applications we recommend applying for fall or spring as there are not many courses offered in the summer.

APPLICATION REQUIREMENTS

Application deadlines are strictly enforced and ALL application materials including transcripts, GRE and TOEFL scores MUST be included and submitted by the application deadline.

*Please note our office does not provide feedback to applicants as to their potential for admission - please review both the ISyE department and Graduate School requirements for admission and if you feel you meet the necessary criteria for applying, please do so.

1. Applicants must first meet all of the requirements of the Graduate School. Click here for more information about these requirements (http://grad.wisc.edu/admissions/requirements/).
2. Applicants must also meet department specific requirements as outlined below:

- B.S. degree or equivalent

**APPLICATION STEPS**

1. **Fill out an online application** ([https://grad.wisc.edu/apply/](https://grad.wisc.edu/apply/)) through the Graduate School website. ([https://grad.wisc.edu/admissions/faq/](https://grad.wisc.edu/admissions/faq/))

2. **List three recommenders and their contact information as part of the online application.** An email will be sent to the recommender asking that they submit their letter online using the Graduate School’s recommendation form. Applicants can log back into their online application to re-send the email request if the recommender loses the email. Letters of recommendation must be submitted electronically.

3. **Submit a Statement of Purpose** ([https://grad.wisc.edu/prospective/prepare/statement/](https://grad.wisc.edu/prospective/prepare/statement/)) with your online application. In this document, applicants should explain why they want to pursue further education in ISyE and discuss which UW faculty members they would be interested in doing research with during their graduate study.

4. **TOEFL Exam Information:** Ask ETS ([https://www.ets.org/](https://www.ets.org/)) to submit your GRE and/or TOEFL scores to the UW–Madison Graduate School (Institution Number 1846). If you have your scores sent to UW–Madison, they will be available online to all departments to which you have applied. The institution code, therefore, is the only number needed. For more information please visit the Graduate School Requirements ([https://grad.wisc.edu/admissions/requirements/](https://grad.wisc.edu/admissions/requirements/)) page. Please note: Exam information must be valid at start date of the semester that you are applying for (nonexpired).

5. **GRE Exam Information:** ([https://www.ets.org/gre/](https://www.ets.org/gre/)) The IE graduate program requires the GRE exam be taken by prospective students as part of the application. **Note there are no specific scoring guidelines for the exam** as the GRE is only one part of consideration for admission into the program. Please note: Exam information must be valid at start date of the semester that you are applying for (nonexpired).

6. **Electronically submit one copy of your official transcript with your application.** Official transcripts of all undergraduate and previous graduate work are required. Unofficial copies of transcripts will be accepted for review, but **official** copies are required for admitted students. Please do not send transcripts or any other application materials to the Graduate School or gradadmission@engr.wisc.edu.

7. **Upload your resume in your application.**

8. **Pay the Application Fee:** Submission must be accompanied by the one-time application fee. It is non-refundable and can be paid by credit card (Master Card or VISA) or debit/ATM. By state law, this fee can only be waived or deferred through the conditions outlined here by the Graduate School. ([https://grad.wisc.edu/apply/fee-grant/](https://grad.wisc.edu/apply/fee-grant/))

**NOTE:** PLEASE **DO NOT SEND MATERIALS/DOCUMENTS TO THE ISyE DEPARTMENT OR GRADUATE SCHOOL UNTIL YOU ARE RECOMMENDED FOR ADMISSIONS. ALL DOCUMENTS SHOULD BE UPLOADED WITH YOUR APPLICATION.

**QUESTIONS?**

Check out the Admissions FAQ ([https://grad.wisc.edu/apply/](https://grad.wisc.edu/apply/)) or contact us at.iegradadmission@engr.wisc.edu.

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**FUNDING**

**GRADUATE SCHOOL RESOURCES**

Resources to help you afford graduate study might include assistantships, fellowships, traineeships, and financial aid. Further funding information ([https://grad.wisc.edu/funding/](https://grad.wisc.edu/funding/)) is available from the Graduate School. Be sure to check with your program for individual policies and restrictions related to funding.

**PROGRAM RESOURCES**

All ISyE PhD students are provided funding and tuition remission, provided they are making satisfactory academic progress. This funding may be in the form of a teaching assistant, research assistant, or project assistant position, or as an external fellowship. The type position providing the funding support may change from semester to semester and is determined based on a combination of factors including the availability of research funds by the student’s faculty advisor and the need for teaching assistants in ISyE courses.

**REQUIREMENTS FOR STUDENTS ASSIGNED TEACHING ASSISTANT POSITIONS**

Students hired into a TA position are required to attend the New Educator Orientation (NEO) training in late August. For more details, please see this website.

All international students assigned to a teaching assistant position must meet the UW–Madison Graduate School’s requirement for spoken English. This requirement can be fulfilled in two ways:

- Pass the SPEAK—you can register for the SPEAK test through ISyE Dept. Human Resources
- Receive a 26 or higher on the speaking portion of the TOEFL test (or equivalent). Provide a copy of your score to ISyE Dept. Human Resources

**MINIMUM GRADUATE SCHOOL REQUIREMENTS**

Review the Graduate School minimum academic progress and degree requirements ([http://guide.wisc.edu/graduate/#policiesandrequirementstext](http://guide.wisc.edu/graduate/#policiesandrequirementstext)), in addition to the program requirements listed below.

**MAJOR REQUIREMENTS**

**MODE OF INSTRUCTION**

<table>
<thead>
<tr>
<th>Face to Face</th>
<th>Evening/Weekend</th>
<th>Online</th>
<th>Hybrid</th>
<th>Accelerated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

**Mode of Instruction Definitions**

- **Accelerated:** Accelerated programs are offered at a fast pace that condenses the time to completion. Students are able to complete a program with minimal disruptions to careers and other commitments.
- **Evening/Weekend:** Courses meet on the UW–Madison campus only in evenings and/or on weekends to accommodate typical business
schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.

**Face-to-Face**: Courses typically meet during weekdays on the UW-Madison Campus.

**Hybrid**: These programs combine face-to-face and online learning formats. Contact the program for more specific information.

**Online**: These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

**CURRICULAR REQUIREMENTS**

**Requirements**

<table>
<thead>
<tr>
<th>Minimum Credit Requirement</th>
<th>51 credits</th>
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</thead>
<tbody>
<tr>
<td>Minimum Residence Credit Requirement</td>
<td>32 credits</td>
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</tbody>
</table>

**Graduate Coursework Requirement**

Minimum 26 credits must be graduate-level coursework. Details can be found in the Graduate School's Minimum Graduate Coursework (50%) policy (https://policy.wisc.edu/library/UW-1244/).

**Overall GPA**

3.00 GPA required.

**Graduate GPA Requirement**

This program follows the Graduate School's GPA Requirement policy (https://policy.wisc.edu/library/UW-1203/).

**Other Grade Requirements**

Grades of C and D received by a candidate in any graduate course will not be counted as credit toward the degree. These grades will be counted in the graduate GPA. See additional grade requirement for HFE Ph.D. students below.

**Assessments and Examinations**

Qualifying exams, preliminary exams, and a final dissertation defense are required of all students. Details may be found in the program handbook.

**Language Requirements**

No language requirements.

**Breadth Requirement**

All doctoral students are required to complete a doctoral minor or Graduate/Professional certificate. The program also has additional breadth requirements. See details below.

**REQUIRED COURSES**

Students choose one of the following research areas (https://engineering.wisc.edu/departments/industrial-systems-engineering/research/). Work with your faculty advisors to answer any questions and to form a plan of study.

**Operations Research, Optimization, and Analytics**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>I SY E 620</td>
<td>Simulation Modeling and Analysis</td>
<td>3</td>
</tr>
<tr>
<td>I SY E 624</td>
<td>Stochastic Modeling Techniques</td>
<td>3</td>
</tr>
<tr>
<td>I SY E/MATH/OTM/STAT 632</td>
<td>Introduction to Stochastic Processes</td>
<td>3</td>
</tr>
<tr>
<td>I SY E/COMP SCI/MATH 728</td>
<td>Integer Optimization</td>
<td>3</td>
</tr>
</tbody>
</table>

**Courses Recommended for Optimization Qualifying Exam**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>I SY E/COMP SCI/ECE 524</td>
<td>Introduction to Optimization</td>
<td>3</td>
</tr>
<tr>
<td>I SY E/COMP SCI/MATH/STAT 525</td>
<td>Linear Optimization</td>
<td>3</td>
</tr>
<tr>
<td>I SY E/COMP SCI/MATH/STAT 726</td>
<td>Nonlinear Optimization I</td>
<td>3</td>
</tr>
<tr>
<td>I SY E/COMP SCI/MATH 728</td>
<td>Integer Optimization</td>
<td>3</td>
</tr>
<tr>
<td>I SY E/COMP SCI/MATH 730</td>
<td>Nonlinear Optimization II</td>
<td>3</td>
</tr>
</tbody>
</table>

**Other Suggested Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>I SY E 412</td>
<td>Fundamentals of Industrial Data Analytics</td>
<td>3</td>
</tr>
<tr>
<td>I SY E/COMP SCI/MATH 425</td>
<td>Introduction to Combinatorial Optimization</td>
<td>3</td>
</tr>
<tr>
<td>I SY E/MED PHYS 512</td>
<td>Inspection, Quality Control and Reliability</td>
<td>3</td>
</tr>
<tr>
<td>I SY E 516</td>
<td>Introduction to Decision Analysis</td>
<td>3</td>
</tr>
<tr>
<td>I SY E 517</td>
<td>Decision Making in Health Care</td>
<td>3</td>
</tr>
<tr>
<td>I SY E 575</td>
<td>Introduction to Quality Engineering</td>
<td>3</td>
</tr>
<tr>
<td>I SY E 603</td>
<td>Special Topics in Engineering Analytics and Operations Research</td>
<td>1-3</td>
</tr>
<tr>
<td>I SY E 604</td>
<td>Special Topics in Manufacturing and Supply Chain Management</td>
<td>1-3</td>
</tr>
<tr>
<td>I SY E 612</td>
<td>Information Sensing and Analysis for Manufacturing Processes</td>
<td>3</td>
</tr>
<tr>
<td>I SY E/MATH/OTM/STAT 632</td>
<td>Introduction to Stochastic Processes</td>
<td>3</td>
</tr>
<tr>
<td>I SY E 645</td>
<td>Engineering Models for Supply Chains</td>
<td>3</td>
</tr>
<tr>
<td>I SY E/COMP SCI 719</td>
<td>Stochastic Programming</td>
<td>3</td>
</tr>
<tr>
<td>I SY E/COMP SCI 723</td>
<td>Dynamic Programming and Associated Topics</td>
<td>3</td>
</tr>
<tr>
<td>I SY E/COMP SCI 727</td>
<td>Convex Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

1 These tracks are internal to the program and represent different pathways a student can follow to earn this degree. Track names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

**Health Systems Engineering**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>I SY E 417</td>
<td>Health Systems Engineering</td>
<td>3</td>
</tr>
<tr>
<td>I SY E 517</td>
<td>Decision Making in Health Care</td>
<td>3</td>
</tr>
<tr>
<td>I SY E/MED PHYS 559</td>
<td>Patient Safety and Error Reduction in Healthcare</td>
<td>2</td>
</tr>
</tbody>
</table>
I SY E 606  Special Topics in Healthcare Systems Engineering 1-3
I SY E/B M I 617  Health Information Systems 3
I SY E/ POP HLTH 703  Quality of Health Care: Evaluation and Assurance 1-3
**Other Suggested Courses:**
I SY E 412  Fundamentals of Industrial Data Analytics 3
I SY E 415  Introduction to Manufacturing Systems, Design and Analysis 3
I SY E 555  Human Performance and Accident Causation 3
I SY E 575  Introduction to Quality Engineering 3
I SY E 601  Special Topics in Industrial Engineering 2
I SY E/B M I 617  Health Information Systems 3
I SY E/ POP HLTH 703  Quality of Health Care: Evaluation and Assurance 1-3

**Other Suggested Courses:**
I SY E 412  Fundamentals of Industrial Data Analytics 3
I SY E 415  Introduction to Manufacturing Systems, Design and Analysis 3
I SY E 555  Human Performance and Accident Causation 3
I SY E 575  Introduction to Quality Engineering 3
I SY E 601  Special Topics in Industrial Engineering 2

1  These pathways are internal to the program and represent different curricular paths a student can follow to earn this degree. Pathway names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

2  Topics vary for this course. Obtain advance approval from your faculty advisor.

**Advanced Manufacturing and Industrial AI**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>I SY E 412</td>
<td>Fundamentals of Industrial Data Analytics</td>
<td>3</td>
</tr>
<tr>
<td>I SY E 415</td>
<td>Introduction to Manufacturing Systems, Design and Analysis</td>
<td>3</td>
</tr>
<tr>
<td>I SY E/M E 510</td>
<td>Facilities Planning</td>
<td>3</td>
</tr>
<tr>
<td>I SY E/M E 512</td>
<td>Inspection, Quality Control and Reliability</td>
<td>3</td>
</tr>
<tr>
<td>I SY E 515</td>
<td>Engineering Management of Continuous Process Improvement</td>
<td>3</td>
</tr>
<tr>
<td>I SY E 575</td>
<td>Introduction to Quality Engineering</td>
<td>3</td>
</tr>
<tr>
<td>I SY E 601</td>
<td>Special Topics in Industrial Engineering</td>
<td>1-3</td>
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</tbody>
</table>

**Human Factors and Ergonomics**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>I SY E/COMP SCI/ DS 518</td>
<td>Wearable Technology</td>
<td>3</td>
</tr>
<tr>
<td>I SY E 552</td>
<td>Human Factors Engineering Design and Evaluation</td>
<td>3</td>
</tr>
<tr>
<td>I SY E 555</td>
<td>Human Performance and Accident Causation</td>
<td>3</td>
</tr>
<tr>
<td>I SY E/ MED PHYS 559</td>
<td>Patient Safety and Error Reduction in Healthcare</td>
<td>2</td>
</tr>
<tr>
<td>I SY E 562</td>
<td>Human Factors of Data Science and Machine Learning</td>
<td>3</td>
</tr>
<tr>
<td>I SY E/B M E 564</td>
<td>Occupational Ergonomics and Biomechanics</td>
<td>3</td>
</tr>
<tr>
<td>I SY E 601</td>
<td>Special Topics in Industrial Engineering</td>
<td>1-3</td>
</tr>
<tr>
<td>I SY E 602</td>
<td>Special Topics in Human Factors</td>
<td>3</td>
</tr>
<tr>
<td>I SY E/PSYCH 653</td>
<td>Organization and Job Design</td>
<td>3</td>
</tr>
<tr>
<td>I SY E/B M E 662</td>
<td>Design and Human Disability and Aging</td>
<td>3</td>
</tr>
<tr>
<td>I SY E 699</td>
<td>Advanced Independent Study</td>
<td>1-5</td>
</tr>
<tr>
<td>I SY E/PSYCH 854</td>
<td>Special Topics in Organization Design</td>
<td>1-3</td>
</tr>
<tr>
<td>I SY E/PSYCH 859</td>
<td>Special Topics in Human Factors Engineering</td>
<td>1-3</td>
</tr>
<tr>
<td>I SY E 961</td>
<td>Graduate Seminar in Industrial Engineering</td>
<td>1-3</td>
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</tbody>
</table>
HFE Course Requirement

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIV ENGR 679</td>
<td>Special Topics in Transportation and City Planning</td>
<td>3</td>
</tr>
</tbody>
</table>

Tools and Methods Courses

HFE Ph.D. students must complete an additional coursework and exam component.

**HFE Course Requirement**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Cognitive Ergonomics:</strong></td>
<td></td>
</tr>
<tr>
<td>ISY E 555</td>
<td>Human Performance and Accident Causation</td>
<td>3</td>
</tr>
<tr>
<td>ISY E/PSYCH 559</td>
<td>Patient Safety and Error Reduction in Healthcare</td>
<td>2</td>
</tr>
<tr>
<td>ISY E 601</td>
<td>Special Topics in Industrial Engineering</td>
<td>1-3</td>
</tr>
<tr>
<td>ISY E 602</td>
<td>Special Topics in Human Factors</td>
<td>3</td>
</tr>
<tr>
<td>ISY E 699</td>
<td>Advanced Independent Study</td>
<td>1-5</td>
</tr>
<tr>
<td>ISY E/PSYCH 859</td>
<td>Special Topics in Human Factors Engineering</td>
<td>1-3</td>
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</table>

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Sociotechnical Systems / Macroergonomics:</strong></td>
<td></td>
</tr>
<tr>
<td>ISY E 555</td>
<td>Human Performance and Accident Causation</td>
<td>3</td>
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<tr>
<td>ISY E/PSYCH 559</td>
<td>Patient Safety and Error Reduction in Healthcare</td>
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<th>Code</th>
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<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Physical Ergonomics:</strong></td>
<td></td>
</tr>
<tr>
<td>ISY E 555</td>
<td>Human Performance and Accident Causation</td>
<td>3</td>
</tr>
<tr>
<td>ISY E/B M E 564</td>
<td>Occupational Ergonomics and Biomechanics</td>
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<td>ISY E/PSYCH 854</td>
<td>Special Topics in Organization Design</td>
<td>1-3</td>
</tr>
</tbody>
</table>

Notes:
1. Various courses in the categories of Research Methods, Statistics, Qualitative Research, Biomechanics Methods, and Psychology count as "Tools and Methods." The Human Factors and Ergonomics faculty group updates the list of "Tools and Methods" courses, and advisors decide which set of courses are appropriate for each student. Work with your faculty advisor regarding non-ISY E course work.
2. Topics vary for this course. Obtain advance approval from your faculty advisor.
3. Prior to defending their dissertation, HFE Ph.D. students must complete at least six seminar/special topics courses at the 700 level or above totaling a minimum of 12 credits; at least 6 credits of these must be in the Human Factors and Ergonomics area. Seminar credits outside the Human Factors and Ergonomics area may be used to satisfy the Industrial Engineering Breadth requirement. Other courses may qualify. Students may submit courses to the HFE Area group for consideration. Transfer students should submit a course syllabus or description and transcript for any courses from other institutions that they would like to have considered for satisfaction of this requirement. The HFE Area group will make this decision.

**Additional Requirements for all ISyE PhD Students**

- **Colloquium/Lecture Series:** For at least two semesters, students must regularly attend a colloquium series. The appropriate colloquium series must be approved by the student's faculty adviser. It is not required to meet this requirement by registering for a course (indeed some colloquium series have no associate course). Instead, attendance at the approved colloquium series must be confirmed by the student's faculty adviser when the student submits their PhD Plan of Study prior to their preliminary examination. Example of colloquium series that can be used to meet this requirement include the ISyE Colloquia and the Systems, Information, Learning and Optimization (SILO) seminars.

- **Industrial Engineering Breadth Requirement:** The breadth requirement is to make sure the Ph.D. student achieves minimum competence in multiple areas of industrial and systems engineering. It consists of taking at least two courses (6 credits) in two different areas outside of the student's focus area. Students can choose from a select set of courses and must attain a grade of B or above in both courses. The courses selected by the student must be approved by the student's advisor. These courses must be completed before a Ph.D. student can request their Preliminary Warrant. Courses the student has taken before entering the Ph.D. program can be counted toward this breadth requirement, including courses taken as an undergraduate. Students should submit the course title and syllabus to the student services coordinator who will then seek approval from the chair of graduate affairs.

- Recognizing the importance of instructional training to our PhD students, each student in the PhD program is required to serve as a teaching assistant for at least one semester during their program. Requests for a partial or full waiver of this requirement should be submitted in writing to the Associate Chair for Graduate Studies and will be reviewed by the Academic Affairs Cluster.

These pathways are internal to the program and represent different curricular paths a student can follow to earn this degree. Pathway names do not appear in the Graduate School admissions application, and they will not appear on the transcript.
POLICIES

GRADUATE SCHOOL POLICIES

The Graduate School's Academic Policies and Procedures (https://grad.wisc.edu/acadpolicy/) provide essential information regarding general university policies. Program authority to set degree policies beyond the minimum required by the Graduate School lies with the degree program faculty. Policies set by the academic degree program can be found below.

MAJOR-SPECIFIC POLICIES

PRIOR COURSEWORK

Graduate Work from Other Institutions
This program follows the Graduate School's policy for Satisfying Requirements with Prior Graduate Coursework from Other Institutions. (https://policy.wisc.edu/library/UW-1232/)

UW–Madison Undergraduate
Not allowed for graduate residence credit requirement for master's thesis option or the Ph.D. track but allowed up to 6 credits numbered 300 level or above toward the graduate degree credit requirement for master's course option tracks but not toward the 50% graduate coursework except for 700 level or above courses. Coursework earned five or more years prior to admission to a master's degree is not allowed to satisfy requirements.

UW–Madison University Special
This program follows the Graduate School's policy for Transfer from UW–Madison University Special Student Career at UW–Madison. (https://policy.wisc.edu/library/UW-1216/)

PROBATION

Criteria for Satisfactory Progress
- Cumulative and semester GPA of at least 3.0 are required. Thesis research grades must be P or S to be making satisfactory academic progress. The following courses are excluded from GPA calculations for this purpose: English for international students, courses lower than the 300 level in any department, 300 level courses in the ISyE department.
- All students are admitted as full-time students unless otherwise noted in writing prior to the start of their program. Full-time students are expected to satisfy the Graduate School requirements for full-time status during all regular semesters in residence unless they have already passed the PhD preliminary examination. Students must have prior written approval from the academic affairs cluster to become part-time students. No special credit load requirements are imposed on approved part-time students.
- Ph.D. students must complete qualifying exam, preliminary exam and final defense within the time constraints specified in the section above.
- Ph.D. students are expected to make consistent progress toward their dissertation, appropriate for their year of study. Satisfactory research progress is determined by the PhD student's faculty advisor. Unsatisfactory progress will be communicated to the student by their faculty advisor, and can be done via the annual assessment of student progress, by giving the student a grade of "U" in a research course, or by a written letter.
- Graduate students are expected to meet academic and professional conduct standards, as described in the ISyE Graduate Handbook. This includes, but is not limited to, behaving in a professionally ethical manner, contributing to a positive work culture, and conducting research ethically.
- Graduate students with assistantship positions (RA, TA, or PA) must adequately perform the responsibilities associated with their position, as determined by the supervisor of the position.

Procedures in the case a student is not making satisfactory progress
- If a graduate student fails to meet satisfactory progress as defined by any of the criteria outlined above, a review committee will be formed to review the circumstances and the student's record, taking input from the student. The review committee will consist of the student's faculty advisor and two other ISyE faculty members appointed by the Associate Chair for Graduate Affairs.
- The review committee will review the student's record and determine if the student is making satisfactory progress. If the student is determined to not be making satisfactory progress, the committee will also decide whether the student should be placed on probation, or in exceptional cases (such as severe professional misconduct or academic misconduct as determined in accordance with UWS 14.04) be immediately removed from the ISyE graduate program and have their funding guarantee removed. In case that a student is put on probation, the committee will provide the student with a written explanation of what is required in order for the probation to be lifted, and in what time frame the requirements must be met.
- Failure to qualify for removal from probation after being on probation for a semester will lead to the removal of a PhD student's funding guarantee.
- A request to appeal the review committee decision must be made by the student to the department chair within 10 days of receiving the decision. The appeal will be reviewed by the academic affairs cluster.

Prohibition
- The probationary status of each student will be reviewed at the end of each regular semester. A student placed on Probation who fails to qualify for removal of probation at the next review of his or her probationary status will not be permitted to continue graduate studies in the IE Department, and any funding guarantee made to the student by the department is removed.
- At the end of a semester when a student is on probation a committee will determine if the student is qualified for removal of probationary status. The committee will include the Associate Chair for Graduate affairs and two other faculty members appointed by the Associate Chair.

ADVISOR / COMMITTEE

This program follows the Graduate School's Advisor policy (https://policy.wisc.edu/library/UW-1232/) and the Graduate School's Committees policy (https://policy.wisc.edu/library/UW-1201/).

Graduate students should always seek advice from their advisor prior to enrolling for courses.

Many PhD students are assigned a faculty advisor when they are admitted to the program, based on a match between their research interests and those of the assigned advisor. Some PhD students are not initially matched to a faculty advisor for their research when admitted. Such students are advised by the associate chair for graduate studies in their first year. During their first year, these students explore research
possibilities with different faculty in the department and choose a faculty advisor by the end of the first year.

Changing advisors during the graduate program may be necessary due to changes in a student’s interests or changes in the funding sources for their support. Students should discuss an advisor change with the faculty in their interest area and request a change of advisor with the ISyE Student Services in Room 3182 in Mechanical Engineering Building.

Ph.D. Committee

Attainment of a Ph.D. degree requires the preparation of a thesis on a research topic selected by the student and their advisor. Once a research project is selected, the student must choose his or her thesis committee*. The ISyE Graduate Program requires the thesis committee shall consist of at least four members for the Preliminary Exam Committee and at least five members for the Final Ph.D. Defense Committee including:

- The Committee Chair (the student’s primary advisor). The Committee Chair must be an ISyE faculty. Emeritus faculty cannot serve as the Committee Chair.
- Three other graduate faculty members or former UW-Madison graduate faculty up to one year after resignation or retirement with two faculty members having their tenure home in ISyE.
- All Committee members are required to be readers.
- The dissertation committee must consist of at least 5 members (4 members for prelim exam) and meet the requirements set forth by the Graduate School, including for example, at least one of the members of the committee must be from a UW-Madison program outside the Industrial and Systems Engineering Department.
- The fifth member of the committee, as well as any additional members, may be from any of the following categories: graduate faculty, faculty from a department without a graduate program, academic staff (including emeritus faculty), visiting faculty, faculty from other institutions, scientists, research associates, and other individuals deemed qualified by the executive committee (or its equivalent).

CREDITS PER TERM ALLOWED

Enrollment of 12 credits or less recommended. (Full time status considered 8-12 credits).

TIME LIMITS

The qualifying examination requirement must be satisfied by the end of the fifth semester of enrollment after entering the ISyE graduate program.

The preliminary exam must be completed within 4 years of joining the ISyE graduate program, and within 3 years of passing the qualifying exam.

The dissertation defense must be completed either within two years after passing the preliminary exam or by the end of the 6th year in the graduate program, whichever is later.

Exceptions to these time limits may be granted by the Academic Affairs Cluster through a petition process.

GRIEVANCES AND APPEALS

These resources may be helpful in addressing your concerns:

- Bias or Hate Reporting (https://doso.students.wisc.edu/bias-or-hate-reporting/)
- Graduate Assistantship Policies and Procedures (https://hr.wisc.edu/policies/gapp/#grievance-procedure)
- Hostile and Intimidating Behavior Policies and Procedures (https://hr.wisc.edu/hib/)
  - Office of the Provost for Faculty and Staff Affairs (https://facstaff provost.wisc.edu/)
  - Dean of Students Office (https://dosof students.wisc.edu/) (for all students to seek grievance assistance and support)
- Employee Assistance (http://www.eao.wisc.edu/) (for personal counseling and workplace consultation around communication and conflict involving graduate assistants and other employees, post-doctoral students, faculty and staff)
- Employee Disability Resource Office (https://employeedisabilities.wisc.edu/) (for qualified employees or applicants with disabilities to have equal employment opportunities)
- Graduate School (https://grad.wisc.edu/) (for informal advice at any level of review and for official appeals of program/departmental or school/college grievance decisions)
- Office of Compliance (https://compliance.wisc.edu/) (for class harassment and discrimination, including sexual harassment and sexual violence)
- Office of Student Conduct and Community Standards (https://conduct students.wisc.edu/) (for conflicts involving students)
- Ombuds Office for Faculty and Staff (http://www.ombuds.wisc.edu/) (for employed graduate students and post-docs, as well as faculty and staff)
- Title IX (https://compliance.wisc.edu/titleix/) (for concerns about discrimination)

Grievance Procedures: Industrial and Systems Engineering

If a graduate student feels unfairly treated or aggrieved by faculty, staff, or another student, the University offers several avenues to resolve the grievance. Student’s concerns about unfair treatment are best handled directly with the person responsible for the objectionable action. If the student is uncomfortable making direct contact with the individual(s) involved, they should contact the advisor or the person in charge of the unit where the action occurred (program or department chair, section chair, lab manager, etc). Many departments and schools/colleges have established specific procedures for handling such situations; check their web pages and published handbooks for information. If such procedures exist at the local level, these should be investigated first. For more information, see the College of Engineering Policies and Procedures (https://engineering.wisc.edu/report-an-incident/academic-grievances- and-complaints/). The Assistant Dean for Graduate Affairs (engr-dean-graduateaffairs@engr.wisc.edu) provides overall leadership for graduate education in the College of Engineering (CoE), and is a point of contact for graduate students who have concerns about education, mentoring, research, or other difficulties.

Procedures for handling graduate student grievances against ISyE faculty, staff, or students:

1. The student is encouraged to speak first with the person toward whom the grievance is directed to see if a situation can be resolved at this level.

2. Should a satisfactory resolution not be achieved, the student should contact the Associate Chair for Graduate Affairs, to discuss the grievance. The Associate Chair will facilitate problem resolution through informal channels and facilitate any complaints or issues of students. The first attempt is to help students informally address
the grievance prior to any formal complaint. Students are also encouraged to talk with their faculty advisors regarding concerns or difficulties, if necessary. University resources for sexual harassment, discrimination, disability accommodations, and other related concerns can be found on the UW Office of Compliance website (https://compliance.wisc.edu/).

3. If the issue is not resolved to the student’s satisfaction, the student can submit the grievance to the Grievance Advisor, which may be either the Associate Chair for Graduate Affairs or the Department Chair, as chosen by the student. The grievance should be submitted in writing, within 60 calendar days of the alleged unfair treatment.

4. On receipt of a written complaint, the Grievance Advisor will form a faculty committee that will review the complaint and gather further information as necessary from the filer of the complaint and other parties involved (including the party toward whom the complaint is directed).

5. The faculty committee will determine a decision regarding the grievance. The Grievance Advisor will report on the action taken by the committee in writing to both the student and the party toward whom the complaint was directed within 15 working days from the date the complaint was received.

6. At this point, if either party (the student or the person toward whom the grievance is directed) is unsatisfied with the decision of the faculty committee, the party may file a written appeal to the College of Engineering Assistant Dean for Graduate Affairs (engr-dean-graduateaffairs@engr.wisc.edu). Either party has 10 working days to file a written appeal to the School/College.

7. Documentation of the grievance will be stored for at least 7 years. Significant grievances that set a precedent will be stored indefinitely.

8. The Graduate School has procedures for students wishing to appeal a grievance decision made at the school/college level. These policies are described in the Graduate School Academic Policies and Procedures - Grievances & Appeals (https://grad.wisc.edu/documents/grievances-and-appeals/).

OTHER
n/a

PROFESSIONAL DEVELOPMENT

GRADUATE SCHOOL RESOURCES
Take advantage of the Graduate School’s professional development resources (https://grad.wisc.edu/pd/) to build skills, thrive academically, and launch your career.

PROGRAM RESOURCES

THE INDIVIDUAL DEVELOPMENT PLAN (HTTPS://GRAD.WISC.EDU/PD/IDP/)

An Individual Development Plan helps with self-assessment, planning, and communication:

- An IDP can help you communicate your professional development and career planning needs and intentions to others including your mentor, which can lead to helpful advice and resources.

- You can use the IDP to make sure you and your mentor’s expectations are clearly outlined and in agreement so that there are no big surprises, particularly at the end of your training.

- The current job market is challenging and research has shown that individuals who perform structured career planning achieve greater career success and satisfaction.

The onus to engage in the IDP process is on you – although your mentor, PI, or others may encourage and support you in doing so. The IDP itself remains private to you, and you choose which parts to share with which mentors. Through the IDP process, you may decide to identify various mentors to whom you can go for expertise and advice.

ENGINEERING CAREER SERVICES (HTTPS://ECS.WISC.EDU/)

Julie Rae, Assistant Director for Graduate Student Career Services

GRADUATE students in all Engineering programs

- Resumes & Cover Letters  https://ecs.wisc.edu/students/resumes-and-cover-letters/
- Job Search Strategies
- Job Offers & Negotiation  https://ecs.wisc.edu/students/offers-and-negotiation/
- CPT for Graduate Students  https://ecs.wisc.edu/students/co-op-and-internship/
- Student appointments: Click Here (http://go.wisc.edu/ecs-grad-appt/) to schedule an appointment with ECS.


UW WRITING CENTER (HTTP://WRITING.WISC.EDU/)

Location: 6171 Helen C. White Hall
Tel: (608) 263-1992

The UW Writing Center provides free of charge face-to-face and online consultations that focus on a number of different writing scenarios (i.e. drafts of course papers, resumes, reports, application essays, cover letters, theses, etc). Writing Center instructors will not edit or proofread papers. Instead, their goal is to teach students to edit and proofread on their own in order to become a better, more confident writer.

LEARNING OUTCOMES

1. Articulates research problems, potentials, and limits with respect to theory, knowledge, or practice within industrial and systems engineering.

2. Formulates ideas, concepts, designs, and/or techniques beyond the current boundaries of knowledge within the industrial and systems engineering.

3. Creates research, scholarship, or performance that makes a substantive contribution to the industrial and systems engineering field.

4. Demonstrates breadth within their learning experiences.

5. Advances contributions of the field of industrial and systems engineering to society.
6. Communicates complex ideas in a clear and understandable manner to variety of audience.
7. Fosters ethical and professional conduct.

PEOPLE

PROFESSORS
Laura Albert (Chair)
Oguzhan Alagoz
John D. Lee
Jeffrey Linderoth
James Luedtke
Robert Radwin
Leyuan Shi
Raj Veeramani
Shiyu Zhou

ASSOCIATE PROFESSORS
Alberto Del Pia
Kaibo Liu
Douglas A. Wiegmann

ASSISTANT PROFESSORS
Justin J. Boutilier
Tony McDonald
Carla Michini
Yonatan Mintz
Xin Wang
Qiaomin Xie
Gabriel Zayas-Caban

TEACHING FACULTY
Amanda G. Smith
Sinan Tas
Charlene Yauch

LECTURERS
Terry Mann
Hannah Silber
Tina Xu

UNDERGRADUATE ADVISORS
Francisca Jofre

GRADUATE PROGRAM COORDINATOR
Pam Peterson

See also Industrial and Systems Engineering Faculty Directory (http://directory.engr.wisc.edu/ie/faculty/).