

INDUSTRIAL AND SYSTEMS ENGINEERING (PHD)

Doctor of Philosophy in Industrial and Systems Engineering

Unit: Speed School of Engineering (<http://engineering.louisville.edu>)(GS)

Department: Industrial and Systems Engineering (<https://engineering.louisville.edu/academics/departments/industrial/>)
Academic Plan Code(s): IE_ _PHD

Program Information

General Information

The PhD degree program is intended for persons having an accredited baccalaureate degree in Industrial and Systems Engineering, but is available to those with other backgrounds. Applicants with other backgrounds should plan on taking some undergraduate background coursework. Students interested in the PhD degree program should consult the Director of the PhD program in the Department of Industrial and Systems Engineering.

Degree Requirements

The award of a Doctor of Philosophy degree indicates that a student has attained mastery of a field and has demonstrated the capacity to perform independent scholarly research. Candidates for the Doctor of Philosophy degree must have a minimum final cumulative grade point average of 3.00 for all academic coursework approved in their flight plan for the doctoral program.

The requirements for the Doctor of Philosophy degree are explained in more detail in the Degree Requirements section (<https://catalog.louisville.edu/graduate/general-policies-procedures-requirements/degree-requirements/>) of this catalog.

Admission Standards

The admission standards for the PhD program in Industrial and Systems Engineering are as follows:

- All admission applications for the program shall include:
 - A completed graduate application (<http://louisville.edu/graduate/futurestudents/apply-materials/application/>) for the Graduate School
 - An application fee
 - At least two letters of recommendation
 - Statement of Purpose (include intended area of study and/or research interests)
 - Resume
 - Official transcript(s) for all previous post-secondary coursework. All transcripts not in English must be certified as authentic and translated verbatim into English.
- The minimum requirement for admission is the baccalaureate degree or its equivalent from an accredited institution.
- The successful applicant will typically have an undergraduate grade point average of 3.00 or above (on a 4.00 scale).
- International students whose primary language is not English must show English language proficiency by either TOEFL/IELTS/Duolingo score or demonstration of a degree awarded from an acceptable English language institution. The successful applicant will typically

have a TOEFL score of 79 or higher or overall IELTS score of 6.5 or higher or a Duolingo score of 105 or higher.

Program Requirements

Normally, it is expected that the student would have completed a master's degree before being admitted to the PhD Program. However, qualified applicants may be admitted directly to the doctoral program after receiving a baccalaureate degree. Such post-baccalaureate degree students will be required to complete an additional 30 credit hours of graduate coursework approved by the department's Director of PhD program. Also, remedial work may be specified for those applicants who, in the opinion of the faculty, do not have a sufficient background.

The PhD program has three different focus areas available: Data Analytics & Operations Research (DA-OR), Human Factors (HF), and Advanced Manufacturing (AM). The minimum curricular requirements for each focus area in the doctoral program are:

Code	Title	Hours
Post-Baccalaureate Coursework		
Approved Master's Level Coursework ¹		30
Core Courses (Select two courses from a focus area below)		6
Technical Electives ²		9
ISE 700	Dissertation Research in Industrial Engineering	9
ISE 695	PhD Seminar ³	2
Minimum Total Hours		56

¹ Master's level coursework must be approved by the Department.

² Non-ISE Electives must be approved by the department.

³ 75% attendance (or excused absence approved by the Department) is required yearly until graduation and one presentation a year (or excused absence approved by the Department) is required by a Doctoral candidate until graduation.

Focus Areas

Data Analytics & Operations Research

Code	Title	Hours
ISE 646	Operations Research Methods	3
ISE 662	Predictive Analytics for Decision Making I	3
ISE 663	Predictive Analytics for Decision Making II	3
ISE 694	Advanced Topics in IE	3

Human Factors

Code	Title	Hours
ISE 671	Advanced Topics in Human Factors Engineering	3
ISE 675	Usability Engineering	3
ISE 682	Quality of Care and Patient Safety	3
ISE 684	Health IT and Clinician Support	3

Advanced Manufacturing

Code	Title	Hours
ISE 600	Additive Manufacturing Processes	3
ISE 601	Additive Manufacturing Structure Design	3
ISE 664	Experimental Design in Engineering	3