INDUSTRIAL ENGINEERING AND MANAGEMENT SCIENCES PHD

Degree Requirements

The following requirements are in addition to, or further elaborate upon, those requirements outlined in The Graduate School Policy Guide (https://catalogs.northwestern.edu/tgs/academic-policies-procedures/).

Master's

Those students enrolled in the IEMS PhD program receive the MS as they progress toward the PhD. For students who are progressing to the PhD, the master's degree is generally awarded upon completion of the following:

Minimum GPA 3.0

Total Units Required: 12

Course	Title
First Year Core Courses	
IEMS 401-0	Applied Mathematical Statistics
IEMS 402-0	Statistical Learning
IEMS 435-0	Stochastic Simulation
IEMS 450-1	Mathematical Optimization I
IEMS 450-2	Mathematical Optimization II
IEMS 460-1	Stochastic Processes I
IEMS 488-0	Economics and Decision Analysis
OPNS 516-0	Stochastic Foundations
Electives (4)	

Other MS Degree Requirements

- Examination on a research paper at end of first year

PhD

Total Units Required: 15

Course	Title
First Year Core Courses	
IEMS 401-0	Applied Mathematical Statistics
IEMS 402-0	Statistical Learning
IEMS 435-0	Stochastic Simulation
IEMS 450-1	Mathematical Optimization I
IEMS 450-2	Mathematical Optimization II
IEMS 460-1	Stochastic Processes I
IEMS 488-0	Economics and Decision Analysis
OPNS 516-0	Stochastic Foundations
Two applied courses from the following list:	
IEMS 481-0	Logistics
IEMS 482-0	Operations
IEMS 486-0	Introduction to Smart Grid Systems
IEMS 441-0	Social Network Analysis
IEMS 473-1	Financial Engineering I
IEMS 444-1	Healthcare Management Science
OPNS 521-0	Foundations of Operations Management
OPNS 524-0	Empirical Methods in Operations Management

Program of Coursework
Courses in major area (at least three)
Courses in minor areas (two courses)

Other PhD Degree Requirements

- **Examinations:** candidacy examination on a research paper at end of first year
- **Prospectus:** Initial part of dissertation research, to be completed by the end of the third year in the program.
- **PhD Dissertation:** based on independent research
- **Final Evaluations:** oral defense of dissertation
- **Other:** at least one experience as an instructor or teaching assistant; satisfy TGS English proficiency requirement